

# Exhibit B

## *Fairfax Reply Report*

**UNITED STATES DISTRICT COURT  
MIDDLE DISTRICT OF NORTH CAROLINA**

SHAUNA WILLIAMS, et al.,

*Plaintiffs,*

v.

REPRESENTATIVE DESTIN HALL, in his  
official capacity as Chair of the House Standing  
Committee on Redistricting, et al.,

*Defendants.*

Civil Action No. 23 CV 1057

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NORTH CAROLINA STATE CONFERENCE OF  
THE NAACP, et al.,

*Plaintiffs,*

v.

PHILIP BERGER, in his official capacity as the  
President Pro Tempore of the North Carolina  
Senate, et al.,

*Defendants.*

Civil Action No. 23 CV 1104

**EXPERT REPLY REPORT OF ANTHONY E. FAIRFAX  
on the Development of Demonstrative Plans for  
State Senate and House Districts for the State of North Carolina**

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October 17, 2024

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## **I. Introduction**

1. I was asked to respond to the expert reports which were prepared by Dr. Michael Barber and Dr. Sean Trende, submitted on September 26, 2024, regarding their opinions on my expert report pertaining to the enacted North Carolina Congressional and State Legislative districts, submitted on August 1, 2024.

## **II. Software, Data, and Technical Process Utilized**

2. The software utilized to analyze Dr. Barber's and Dr. Trende's reports and produce the additional maps was Maptitude for Redistricting ("Maptitude") by Caliper Corporation. Maptitude is one of the leading redistricting software applications utilized by consultants, major nonprofit groups, and governmental entities. The software includes Census 2020 data ("PL94-171") for the state of that was utilized during the map-drawing process. Maptitude also includes a Caliper 2022 dataset that contains the 2021 5-Year ACS Data at the county and census tract level.

## **III. Summary of Opinions**

3. A summary of my conclusions and opinions is:
  - Crossing County Clusters is acceptable when adhering to the Voting Rights Act ("VRA").<sup>1</sup>
  - The high population deviations for the districts in the Wake County House, Forsyth-Stokes House, Brunswick-New Hanover-Columbus Senate and Iredell-Mecklenburg Senate clusters are not explained by adherence to traditional redistricting criteria.
  - The Illustrative Plans are reasonably configured districts that satisfy *Gingles* I, adhere to traditional redistricting criteria, and do not use race as a predominant factor.

## **IV. Methodology**

4. In addition to the original data utilized in my expert report of August 1, 2024, I also reviewed and, in some cases, utilized the maps and data provided by Dr. Barber and Dr. Trende in their respective reports.

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<sup>1</sup> "[T]o ensure full compliance with federal law, legislative districts required by the VRA shall be formed prior to creation of non-VRA districts." *Stephenson v. Bartlett*, 355 N.C. 354, 383 (2002).

5. Throughout the reports of Dr. Barber and Dr. Trende, they refer to precincts instead of Voting Districts (“VTDs”) in their analysis. I will follow suit and use precincts instead of VTDs throughout this reply report.
6. As I did in my opening report, I isolated the select cluster regions and performed simple modifications to the 2023 Enacted Plans in order to conduct my apportionment analysis. I used Maptitude. In order to respond to Dr. Barber’s suggestion that such changes were not possible, maps and reports were generated to display and present the small changes made using Maptitude. The partisan performance of the cluster districts was obtained by averaging the same 19 elections Dr. Barber used in his analysis. Like Dr. Barber, the data for these 19 elections was obtained from Dave’s Redistricting (“DRA”).

## V. Apportionment Analysis

7. Dr. Barber disagrees with my statement that I find “no redistricting criteria justification for . . . the Enacted Plan[s]’ high population deviation” in specific regions of the state.<sup>2</sup> In support of this, he primarily cites the fact that none of the districts I examine in the enacted plans breach the state’s +/- 5% deviation limit for legislative districts.<sup>3</sup> This fact is not in dispute, and so Dr. Barber’s report misses the point. I was not asked to determine whether the specific clusters fit within the state’s maximum allowable population deviation. Instead, I was asked to analyze the specific clusters and make a determination of whether any traditional redistricting criteria explained the population deviations that do exist within those specific clusters.<sup>4</sup> Dr. Barber’s analysis tends to support rather than undercut my conclusion that the deviations I identified are not justified by any traditional redistricting criteria (i.e., equal population, contiguity, compactness, respect for political subdivisions, and preserving communities of interest).<sup>5</sup>
8. Dr. Barber also mentions my Illustrative Plans and their population deviations.<sup>6</sup> My Illustrative Plans are, as the name denotes, illustrations. They are not designed to be the only possible plans, but instead demonstrate what reasonably configured districts can be drawn that would also include majority-BVAP districts. In this case, the Illustrative Plans demonstrate that *Gingles* I can be satisfied by constructing reasonably configured majority-BVAP districts. My Illustrative Plans and the clusters examined in my apportionment analysis cannot be

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<sup>2</sup> Fairfax August 1, 2024 Report, pg 75.

<sup>3</sup> Barber September 26, 2024 Report, pg 36.

<sup>4</sup> In addition, I was not asked to consider non-redistricting criteria aspects such as the placement of geographic assets within certain districts. That is to say, placing a golf course or shopping center or another desired asset within a particular district. Those inclusions occur during the process of redistricting but are not part of the established traditional redistricting criteria.

<sup>5</sup> See 2023 Senate Plan Criteria, N.C. Gen. Assembly (Oct. 2023), <https://webservices.ncleg.gov/ViewDocSiteFile/81635> (“Traditional Districting Principles. We observe that the State Constitution’s limitations upon redistricting and apportionment uphold what the United States Supreme Court has termed ‘traditional districting principles.’ These principles include factors such as ‘compactness, contiguity, and respect for political subdivisions.’ *Stephenson II* (quoting *Shaw v. Reno*, 509 U.S. 630 (1993)).”).

<sup>6</sup> Barber September 26, 2024 Report, pg 37.

directly compared without considering that, unlike the clusters in the Enacted Plan, my Illustrative Plans adhere to both traditional redistricting criteria and compliance with *Gingles* I.

9. In contrast, as I mentioned in my initial report regarding population deviations within certain districts in the 2023 Enacted Plans, “I was able to create and observe multiple options that would allow me to shift one or two VTDs that would bring the district population closer to the ideal population and the overall population deviation closer to zero.”<sup>7</sup> In his rebuttal, Dr. Barber does not dispute the possibility of this and the existence of such alternative possibilities is something I have commonly provided an expert opinion as to.<sup>8</sup>
10. However, since Dr. Barber suggests that such simple changes are not possible, Appendix A includes illustrative examples of each modified select cluster region, where the district’s population deviation moves closer to the ideal. For each of the cluster regions, I was able to locate, within a few minutes, multiple options where one or two precincts (VTDs) would bring the district’s population closer to the ideal and result in similar or better redistricting criteria metrics (e.g., compactness or political subdivision splits). *See* Appendix.
11. For example, the modified HD Wake County Cluster shows a lower deviation with just two precinct shifts (App’x Figure A-1 (precinct shifts in red), Table A-1 (deviation)) a change that slightly increases compactness scores (App’x Table A-2), and splits the same number of census places (App’x Figure A-2). Similar precinct shifts yield the same results in other clusters, proving that Dr. Barber’s doubts of whether this is possible are misplaced. *See* Appendix at pgs A-5–A-13.
12. The process of selecting a precinct and viewing the potential changed population for a district in Maptitude is extremely simple and straightforward. Any beginner to moderately experienced Maptitude map drawer would be able to easily identify multiple precinct options within minutes. The process is literally three steps. One, select the precinct (VTD) option as the desired level. Two, select the district to add to. And three, select the precinct to add. Once the precinct is selected the map drawer can view the total population, population deviation, and other results in the display window. To view other precinct options the map drawer would simply click on the clear the selection button and select another precinct.
13. The examples in Appendix A are by no means all or even most of the possible options for reducing the population deviation in each of these clusters; they are included simply to reassure that it is quite simple to reduce the population deviation, as I attested to in my initial report. But these examples confirm that Dr. Barber’s asserted concerns about the range of possibilities I described in my initial report are misplaced and without support.

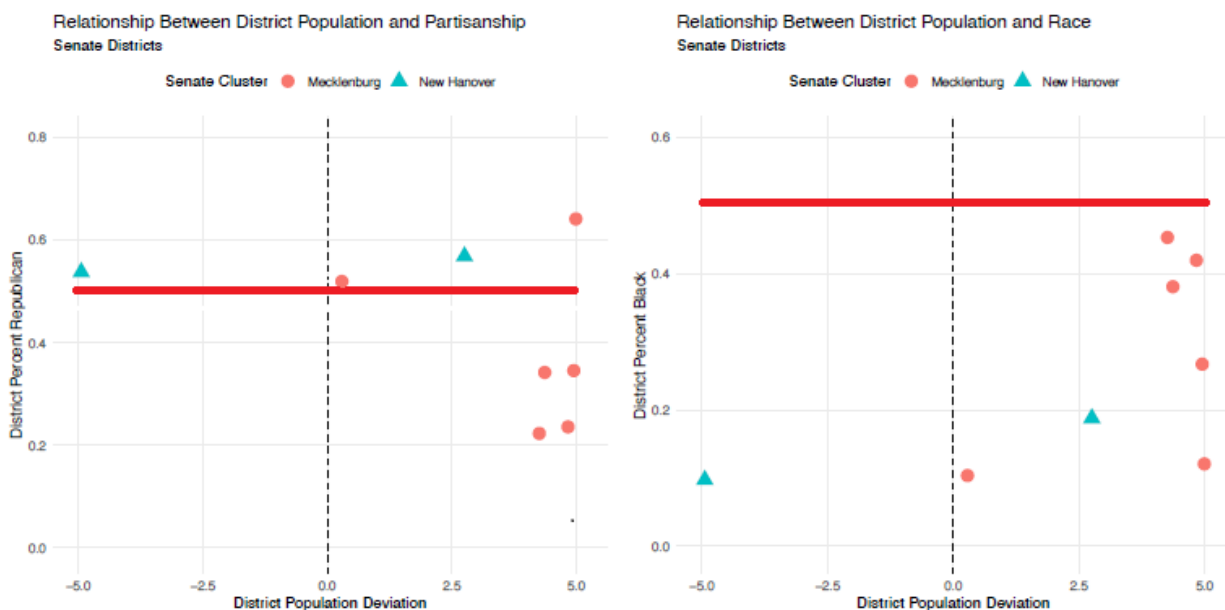
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<sup>7</sup> Fairfax August 1, 2024 Report, pgs 65-68.

<sup>8</sup> *See, e.g.*, Fairfax August 1, 2024 Report, pg 76 (attesting to the possibility of drawing such alternatives).

## VI. Race & Partisan Analysis

14. Dr. Barber also provides a type of scatter plot graph in Figure 16 of his report, which depicts population, partisan, and racial data on the House and Senate districts located in four clusters. On the left side, the graph shows the relationship between district population and partisanship (percent Republican) for both the House and Senate districts within each cluster. On the right, it shows the relationship between district population and race (percent Black) for both the House and Senate districts within each cluster.
15. Figure 1 shows evidence from Dr. Barber's own report that disputes his claim that "there is not a relationship between the population deviation of the district and demographic factors such as race or party."<sup>9</sup> I have added a red line to indicate the 50% Republican percentage for the districts and 50% Black percentage for the districts. Figure 1 below depicts only the bottom two graphs which present the Mecklenburg and New Hanover Senate clusters that are included in Dr. Barber's Figure 16.<sup>10</sup>



**Figure 1 - Dr. Barber's Report's Figure 16 – Mecklenburg & New Hanover Cluster Districts**

<sup>9</sup> Barber September 26, 2024 Report, pg 37. I assume without endorsing or accepting the accuracy and appropriateness of Dr. Barber's partisanship figures, which appear to come from DRA, for the purposes of responding to his Report.

<sup>10</sup> The Mecklenburg cluster includes Iredell and Mecklenburg counties. New Hanover cluster includes the counties of Brunswick, New Hanover, and Columbus.



16. Dr. Barber's graph shows that there in fact "is" a relationship in the Mecklenburg County cluster between race and overpopulation<sup>11</sup> and partisanship and overpopulation within the cluster. Figure 1 demonstrates that every district in the Mecklenburg cluster is significantly overpopulated except for SD42, which is both the Whitest district in the cluster and almost 5% less populated than every other district in the cluster. This is further exacerbated by the fact that the only other significantly overpopulated district in the cluster with a similarly low BVAP is SD37, which contains all of Iredell County and as a result was guaranteed to be significantly more White than any of the Mecklenburg-based districts. Figure 1 reveals that the Mecklenburg County districts also show a pattern of overpopulation for the Democratic districts (i.e., low Republican percentage). Four Senate districts are below 40% Republican and are near to 5% population deviation. Only one district with a majority Republican percentage is overpopulated near 5% (the Iredell-based district).
17. But the Mecklenburg-Iredell County cluster contains only one district, SD42, that is near the ideal population size while the other districts are over 4% with the majority near 5% population deviation. SD42 contains the lowest percentage of the Black population shown on the right graph with the orange circle located in the bottom center. The graphs are revealing. On the right, SD42 is the only orange circle in the middle of the graph, and also the furthest down the chart – indicating that it is both the least populated and has the fewest Black residents of all the Mecklenburg cluster districts. On the left, SD42 is again the only orange circle in the center of the graph, showing it is a borderline Republican performing district. Thus, it appears that the other districts SD37, SD38, SD39, SD40, and SD41 are packed in order for SD42 to remain lower in population.<sup>12</sup> Thus, this lower population appears to be due to keeping SD42 as white as possible, and thus making it as Republican as possible. In essence, since SD42 is a borderline Republican district, if it adds additional areas from the adjacent districts (all of which have much higher BVAPs), it will become a less White district and most likely become a Democratic district.
18. On the other hand, in the New Hanover cluster, SD7, which is the left blue triangle shown on the left graph, is underpopulated. SD7 is also a borderline Republican performing district. One of the reasons why it is underpopulated is that SD8 carves out a portion of SD7 in the city of Wilmington, that is the highest BVAP portion of the city. This cracks a compact Black population in downtown Wilmington between two districts, thus producing two districts with roughly similar populations of Black voters instead of unifying the community in a single district. Thus, once again, this lower population appears to be due to removing Black population in order to keep SD7 a Republican district. See Appendix A at A-8–A-10, A-14.

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<sup>11</sup> In the context of this analysis, overpopulation refers to greater than the ideal population size while underpopulation is lower than the ideal population size.

<sup>12</sup> SD37 is compelled to be overpopulated due to encompassing the whole county of Iredell within the district. However, the other districts, SD38, SD39, SD40, and SD41 could be reduced by adding population to SD42.

19. Reviewing Dr. Barber’s graph using race (i.e., Black percentage) on the right, the districts with the highest Black percentage consistently show overpopulation. The three Senate districts with close to 40% Black and one close to 30% Black are overpopulated by almost 5%.

## **VII. The Illustrative Plans**

### **A. Adherence to *Stephenson*’s County Clusters**

20. The State of North Carolina includes redistricting guidance for developing the State Senate and House Plans to follow a set of county clusters. The county clusters are “largely algorithmically determined through an optimization procedure outlined by the NC Supreme Court in *Stephenson v. Bartlett*.”<sup>13</sup>
21. The guidance for these county clusters requires the map drawer to create North Carolina legislative districts within the clusters. Dr. Barber and Dr. Trende state that all of my Illustrative Plans contain districts that cross county clusters and violate *Stephenson*’s Criteria.<sup>14</sup> Dr. Barber states, “Mr. Fairfax’s Illustrative Senate and House maps violate the *Stephenson* Criteria.”<sup>15</sup>
22. However, the exception to crossing the county cluster boundaries was accomplished in order to adhere to the VRA.<sup>16</sup> Careful consideration was given to follow the cluster groups of the state’s Enacted Plan as much as possible and only alter the districts that were impacted by establishing the VRA districts. Thus, the statements by Dr. Barber and Dr. Trende of some districts in my Illustrative Plan crossing county clusters, while accurate, do not recognize that these crossings are acceptable given the overriding need to comply with the VRA.

### **B. Black Population Compactness and Race Predominance**

23. Dr. Barber and Dr. Trende use dot density maps of the Black population throughout their reports. Their reports present dot density maps to reflect the compactness of the Black population and race predominance. The primary implications Dr. Barber and Dr. Trende draw from these maps are that, in their opinions, the Illustrative Plan’s majority Black districts do not meet the “geographically compact” component of *Gingles* I.<sup>17</sup>

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<sup>13</sup> Christopher Cooper et al., *NC General Assembly County Clusterings from the 2020 Census*, Quantifying Gerrymandering, <https://sites.duke.edu/quantifyinggerrymandering/files/2021/08/countyClusters2020.pdf>.

<sup>14</sup> Barber September 26, 2024 Report, pgs 46-47; Trende September 26, 2024 Report, pg 74-79.

<sup>15</sup> Barber September 26, 2024 Report, pg 5.

<sup>16</sup> See *supra* note 1.

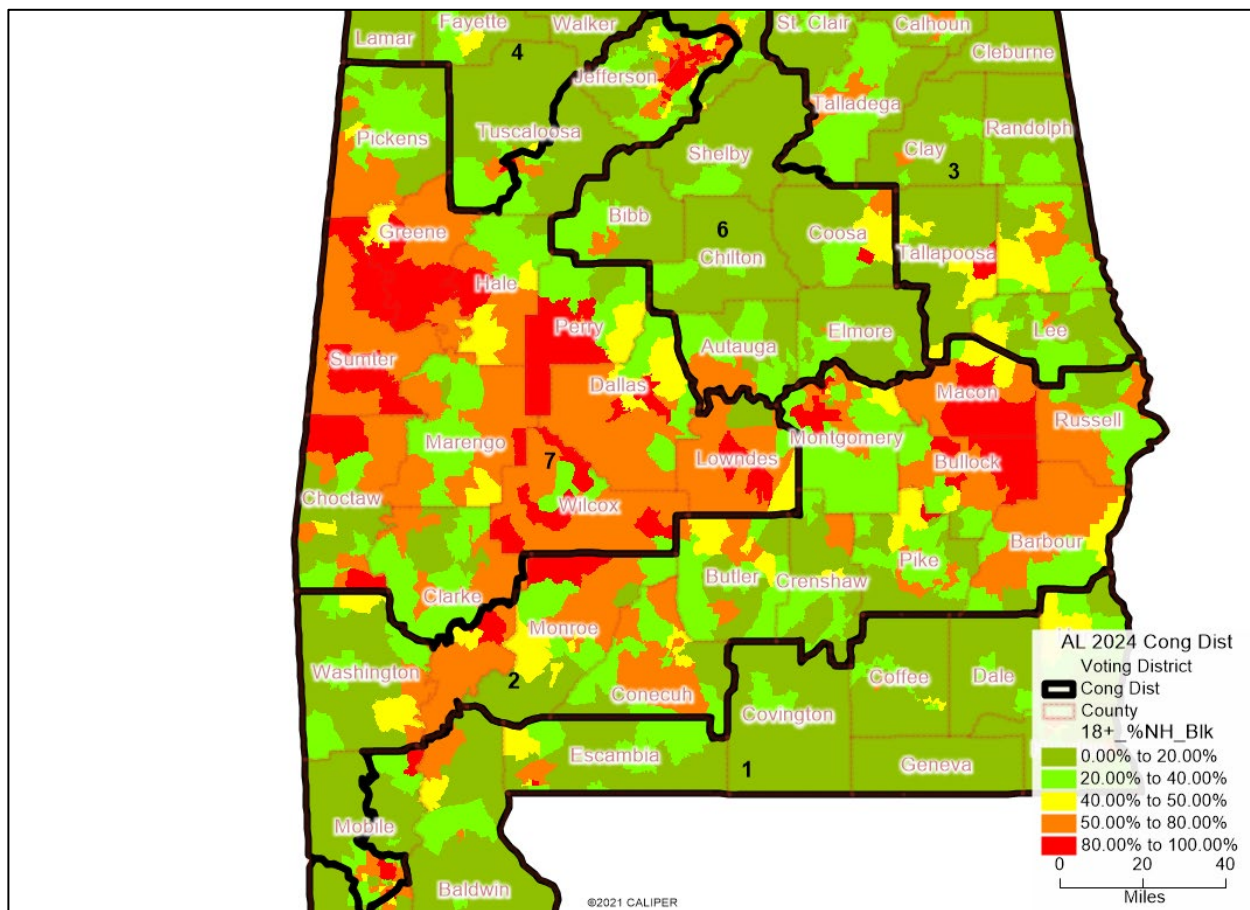
<sup>17</sup> Despite this suggestion, however, neither Dr. Barber nor Dr. Trende ever conclude that any of my illustrative districts are not reasonably configured.

24. Using dot density maps to critique the compactness of a *Gingles* I demonstrative is misguided. The focus of the *Gingles* I prong is on the configuration of the district itself. *Gingles* I states, that “the minority group must be able to demonstrate that it is sufficiently large and geographically compact to constitute a majority in a single-member district.”<sup>18</sup> The focal point is to “constitute a majority in a single member district.” *Gingles* I does not direct the analyst to analyze that the minority group is geographically compact alone. Instead, it requires determining whether the minority group constitutes a geographically compact single-member “district.” The way analysts determine whether the minority community is sufficiently geographically compact is to analyze the district. Hence, in my opinion the dot density approach by Dr. Barber and Dr. Trende distorts the requirements of the *Gingles* I precondition.
25. Dr. Barber’s and Dr. Trende’s use of these dot density maps can be misleading in a variety of ways when analyzing the compactness of an illustrative plan. First, using the dot density maps as an analysis measurement for geographic compactness could incorrectly eliminate rural majority Black districts from being compact. If the Black population is not concentrated and encompassed by the district in a central area of the district, Dr. Barber and Dr. Trende would consider the population noncompact, and thus consider any district including this population to not be reasonably configured. This would prevent any rural Black population from being included in a reasonably configured district, which clearly cannot be the intent of “geographically compact” of *Gingles* I.
26. Second, the dot density map fails to show when the Black population may exist at a lower amount but consistently throughout the district. This too would represent a noncompact district using the dot density maps, unlike the choropleth maps, which better demonstrate when a region has Black population distributed across an area. Relying on the dot density maps, which obscure these evenly distributed populations, would prevent a district including these populations from ever being reasonably configured. This clearly cannot be the intent of “geographically compact” either.
27. Third, Dr. Barber’s and Dr. Trende’s comments imply that majority Black districts that combine two or more separate concentrated areas of Black populations could not be considered compact. However, this is not the case, as long as the district is shown to be reasonably compact.
28. Evidence of all three of these issues can be seen by reviewing the congressional plan approved in the recent *Allen v. Milligan* redistricting court case. Figure 2 shows the configuration of the two majority Black districts that were approved in *Allen v. Milligan* and found to be geographically compact. The map shows the two majority Black congressional districts. The

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<sup>18</sup> *Thornburg v. Gingles*, 478 U.S. 30, 50 (1986).

map includes a thematic layer of precincts that show the Black VAP percentage. The orange and red precincts indicate majority Black.



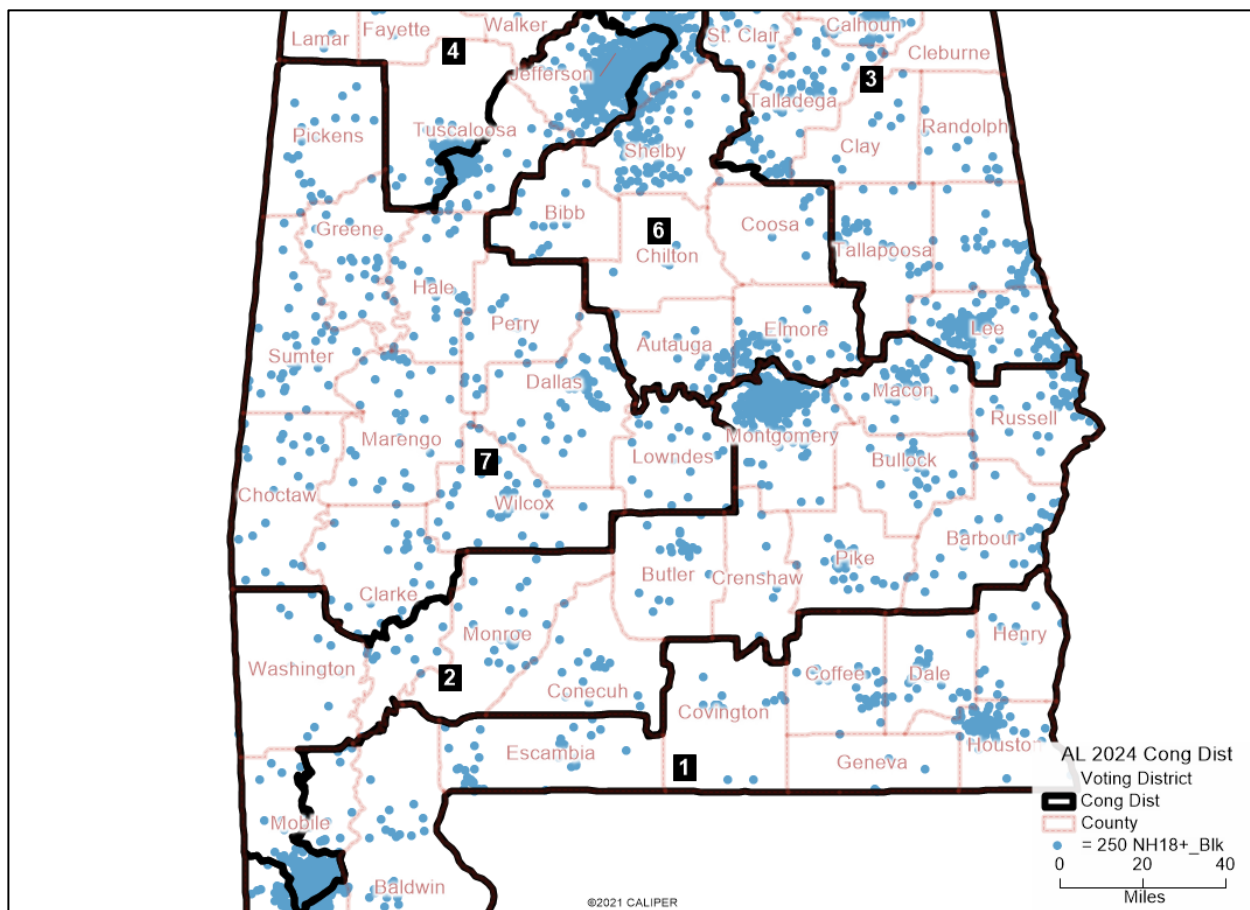
**Figure 2 - *Allen v. Milligan* Approved 2024 CD Plan Black VAP% (MMD Zoom)**

29. Here, the new majority Black district (District 2) is a district that extends from the rural areas near the western part of the state to the east side of the state to include portions of the city of Mobile. It is notable that the city of Montgomery is also combined within district 2. Dr. Barber's and Dr. Trende's arguments that connecting two or more concentrated Black populations prevents a district from being reasonably configured are inconsistent with the use of Figure 2's displayed Alabama Congressional as a court-approved Section 2 remedial map.<sup>19</sup> Finally, this Court-ordered plan clearly allows for the consideration of race by approving the

<sup>19</sup> It is important to note that I am not comparing criteria metrics between congressional and state legislative districts, or between states. This example only compares the distribution of Black population throughout the district.

connection of the rural Black population in west Alabama to the urban Black population in a portion of the city of Mobile.

30. In addition, using the dot density technique that Dr. Barber and Dr. Trende deploy would indicate that the approved Alabama congressional majority Black districts were not reasonably compact. Figure 3, however, shows that sparse dot density patterns of Black population similar to those in their reports are included in Alabama congressional districts 2 and 7. These patterns are similar to those Dr. Barber and Dr. Trende claim show that the Black population in my illustrative districts is not compact. Once again, the approved configuration is evidence against the argument that a single district cannot connect two or more concentrations of Black population.



**Figure 3 - *Allen v. Milligan* Approved 2024 CD Plan Black VAP Dot Density (MMD Zoom)**

31. Finally, it is important to note that purpose of an illustrative plan. As stated earlier, my Illustrative Plans are intended to be illustrations that prove it is possible to draw a reasonably configured majority-minority district in each of the examined areas. The Illustrative Plans are



not designed to be the only possible plan, but instead demonstrate that something can be achieved. During my map-drawing, I determined that there are numerous possibilities for constructing reasonably configured majority-Black districts in each of the areas I examined, and different map-drawers may arrive at many of those different possibilities. However, that does not change what my Illustrative Plans show: it is possible to draw reasonably configured majority-Black districts in northeast North Carolina sufficient to satisfy *Gingles* I.

C. Majority-Minority Districts between the Enacted and Illustrative Plans

32. In Figure 25 of Dr. Barber's report, he displays a graph that shows the change in Black percentage of Enacted and Illustrative Plan's Senate districts. The graph shows an increase in the Black percentage for some Senate districts and a decrease in others. This is certainly expected when an Illustrative Plan develops new majority minority districts. The graph provides a depiction of the ordinary changes in minority district population that occur when analyzing the *Gingles* I precondition.

D. Moment of Inertia Compactness Measure

33. Dr. Trende spends quite a bit of narrative on explaining compactness. While I do not have any significant disagreement with his definition and explanation of the various compactness measures, I do disagree with the use of moment of inertia (MOI) and population compactness measures.

34. Dr. Trende states that "The MOI was the more widely used technique in the early days of peer-reviewed studies of gerrymandering and redistricting, but began to fall by the wayside as other district compactness metrics were proposed and computing them became more attainable with computers."<sup>20</sup> This statement is certainly accurate from the *Thornburg v. Gingles* decision until today. I have been involved in redistricting since the 1990 round of redistricting and I have not seen MOI used even moderately in redistricting. In addition, the current redistricting industry seems to be settling on two compactness measures, Reock and Polsby-Popper.<sup>21</sup>

35. I have reviewed and worked with multiple redistricting applications throughout my thirty years of redistricting experience, and I have not seen one application that includes the MOI compactness measure. If MOI was a critical and desired compactness measure, there would be redistricting applications that would incorporate it into their software.

36. As far as the general concept of population compactness is concerned, all of the population compactness measures have, as Dr. Trende states, "fall[en] by the wayside." One reason is that

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<sup>20</sup> Trende September 26, 2024 Report, pg 11.

<sup>21</sup> There are two major types of compactness measures, area or dispersion and perimeter. Reock represents the most widely used area or dispersion compactness measure while Polsby-Popper represents the most widely used perimeter compactness measure.

the legislatures and other governmental bodies in charge of redistricting view compactness as a purely geographic construct for the district. So, when the state of North Carolina and other jurisdictions include the redistricting criteria for compactness, it is overwhelmingly applied to the district and not the population within.

37. Finally, the guidance of the *Gingles* I precondition is “the minority group must be able to demonstrate that it is sufficiently large and geographically compact to constitute a majority in a single-member district.”<sup>22</sup> The “single-member district” portion points the map drawer to focus on the district (that reflects the compactness of the minority group) and not the internal population. Thus, the shape of the district is the focal point for the “geographically compact” component of *Gingles* I.

### VIII. Illustrative Senate Maps

#### A. Illustrative Senate Plan A & B SD2

38. SD2 for Illustrative Plan A and Illustrative Plan B are identical. Dr. Barber’s primary criticism of the Illustrative Plans’ SD2 lies with its crossing of county clusters. He does not allege that race predominates in the development of the Senate Illustrative Plans’ SD2.<sup>23</sup>
39. Dr. Trende’s only criticism of the Illustrative Plans’ SD2 is that, in his opinion, the district “features disparate Black populations linked together across a large district” and the “Black communities included in this district have important socioeconomic dissimilarities.”<sup>24</sup> This criticism is misplaced for a few reasons.
40. First, the first *Gingles* I precondition asks whether it is possible to construct a reasonably configured majority-minority district, which I have provided. It accounts for the fact that, through many states in the South, Black populations can occur in concentrated urban areas, that can nonetheless be included in reasonably compact districts that also encompass additional, separate urban and rural areas.<sup>25</sup>
41. Even accepting that Dr. Trende is applying the correct analysis here, an alternate perspective of the analysis of disparate Black populations from Dr. Trende’s dot density maps can be seen using a thematic color (choropleth) of the Illustrative Plans’ SD2. A different perception can be made by viewing the entire district and using Black Voting Age Population (VAP) or BVAP%<sup>26</sup> divided into five ranges. As Figure 4 shows, the Black population exists throughout the district and not in only three or four locations. The red and brown colored precincts

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<sup>22</sup> *Thornburg v. Gingles*, 478 U.S. 30, 50 (1986).

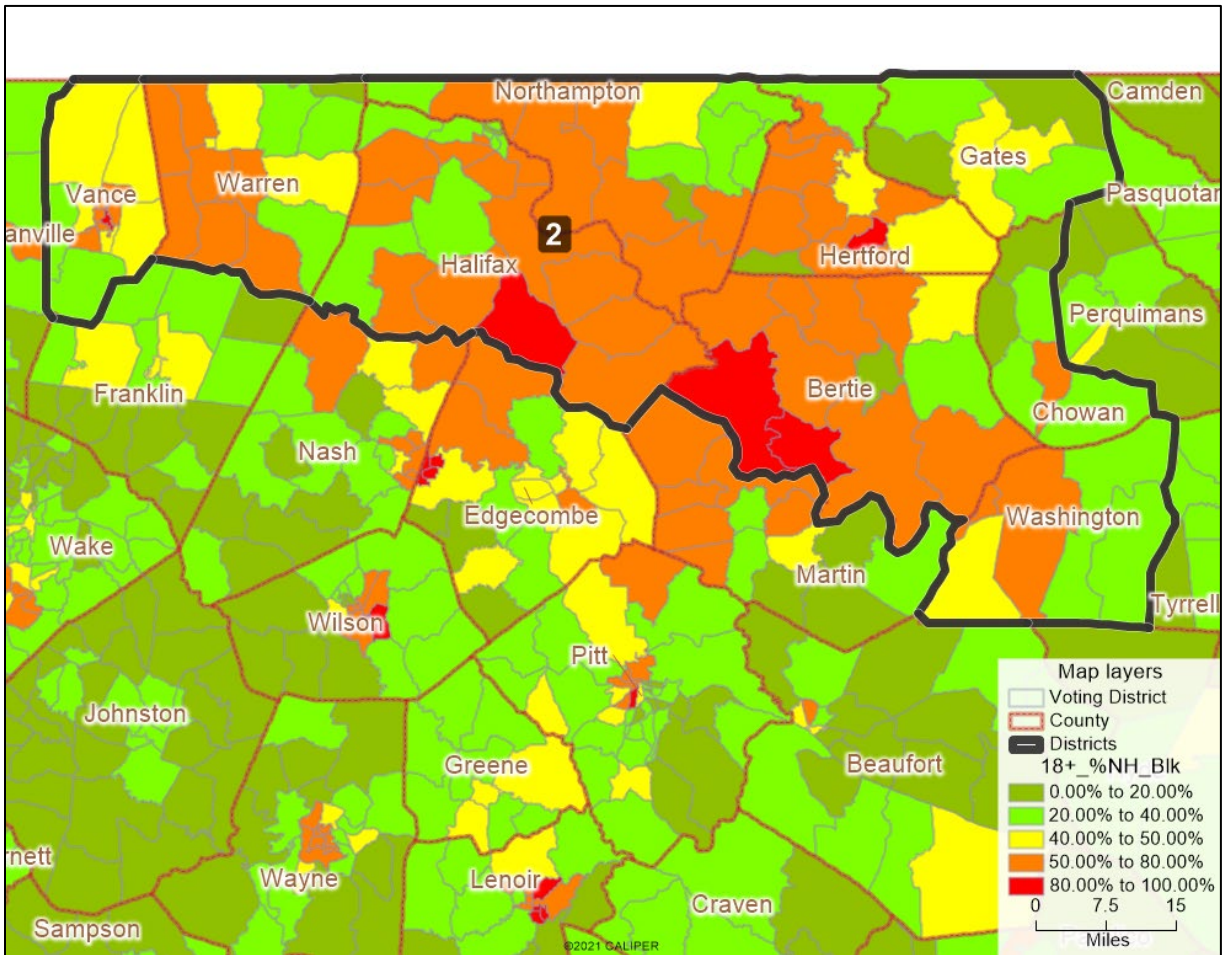
<sup>23</sup> Barber September 26, 2024 Report, pg 56.

<sup>24</sup> Trende September 26, 2024 Report, pg 59-61.

<sup>25</sup> See *supra* pgs 10-12 (discussing *Allen v. Milligan*).

<sup>26</sup> BVAP refers to the 2020 Census Not Hispanic Black Voting Age Population.

indicate majority Black. The yellow represents those precincts that are between 40% and 50% Black.



**Figure 4 - Senate Illustrative Plans A & B SD2 – Precincts Black VAP%**

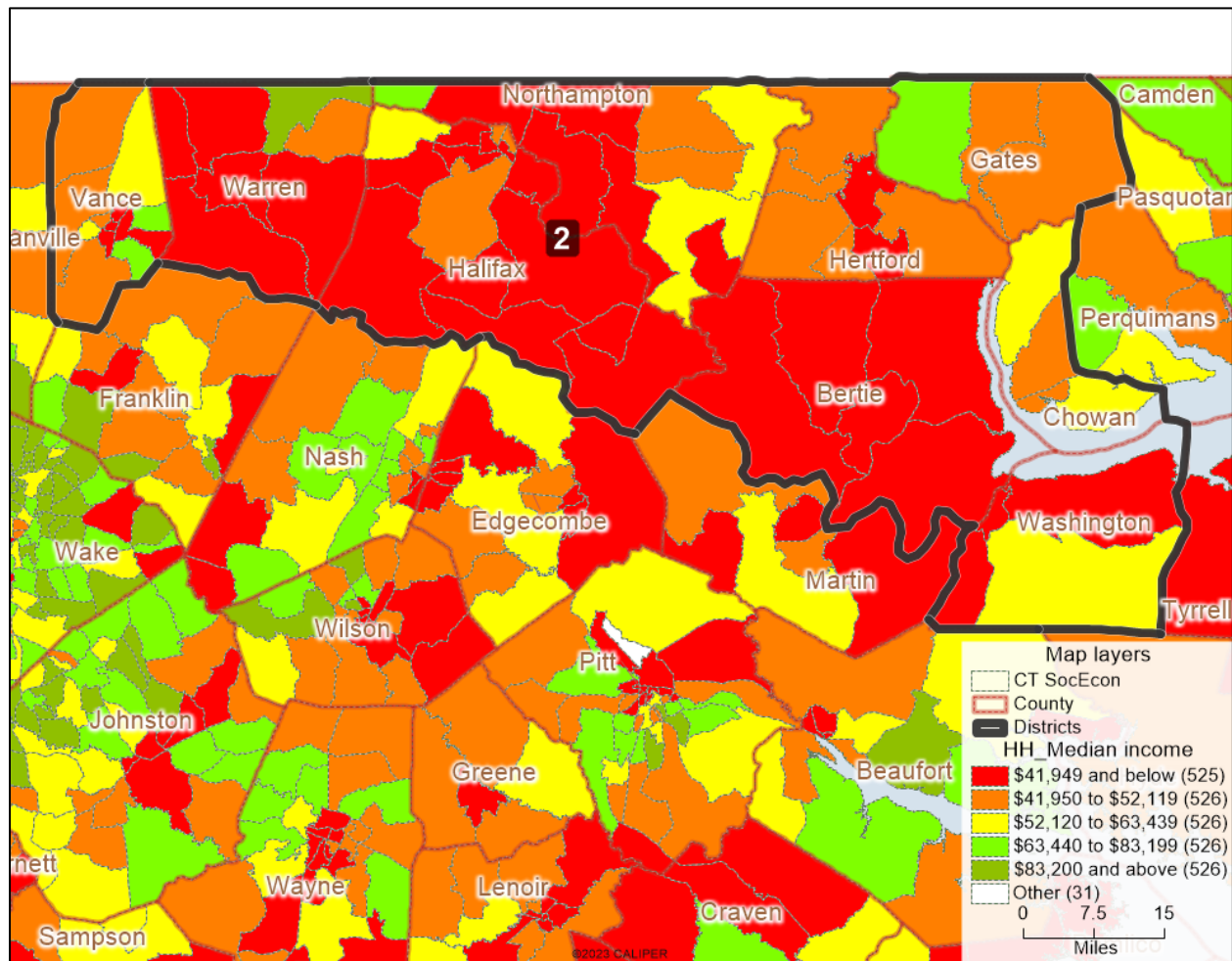
42. Also, reviewing SD2 in Figure 5 at the census tracts level reveals that Illustrative Plans' SD2 consists mostly of census tracts that are in the bottom two quintiles<sup>27</sup> for median household income<sup>28</sup> for the state. Even Gates County contains two census tracts that are in the second to the bottom quintile (shown in brown). Contrary to Dr. Trende's opinion that Gates County has "important socioeconomic dissimilarities"<sup>29</sup> with the rest of the counties, it is clear that the lone higher income census tract is raising Gates County's median household income value, and that the majority of the county is in line with the rest of the district.

<sup>27</sup> Quintiles divides the features from top to bottom in five equal number of features. In this instance, the state's census tracts are sorted from high to low income and divided into five ranges with equal number of census tracts.

<sup>28</sup> Using Caliper Corp.'s 2022 Dataset that reflects 2021 5-Year ACS Data.

<sup>29</sup> Trende September 26, 2024 Report, pg 61.





**Figure 5 - Senate Illustrative Plans A & B SD2 – Census Tracts Median Household Income**

43. Finally, SD2 is a majority Black Senate district that is made up of whole counties. In my experience, it is very rare to find a majority Black state legislative district that consists only of whole counties. In addition, the Illustrative Plans' SD2 is very compact and adheres to traditional redistricting criteria. Thus, I continue to conclude that the Illustrative Plans' SD2 clearly meets the *Gingles* I precondition and is reasonably configured.

**B. Illustrative Senate Plan A SD5**

44. Dr. Barber suggests that race predominates the development of the Senate Illustrative Plan A's SD5. Dr. Barber states, "This careful attention to race suggests that the particular boundaries of these districts were primarily guided by racial considerations since no other traditional

redistricting criteria, such as population equality, municipal boundaries, county boundaries, or any apparent communities of interest are noted. . .”<sup>30</sup>

45. However, all the Illustrative Plans were developed considering traditional redistricting criteria as well as considering race. The Senate Illustrative Plan A was developed to respect political subdivisions of cities and towns and preserve the communities of interests of census designated places (CDPs).<sup>31</sup>

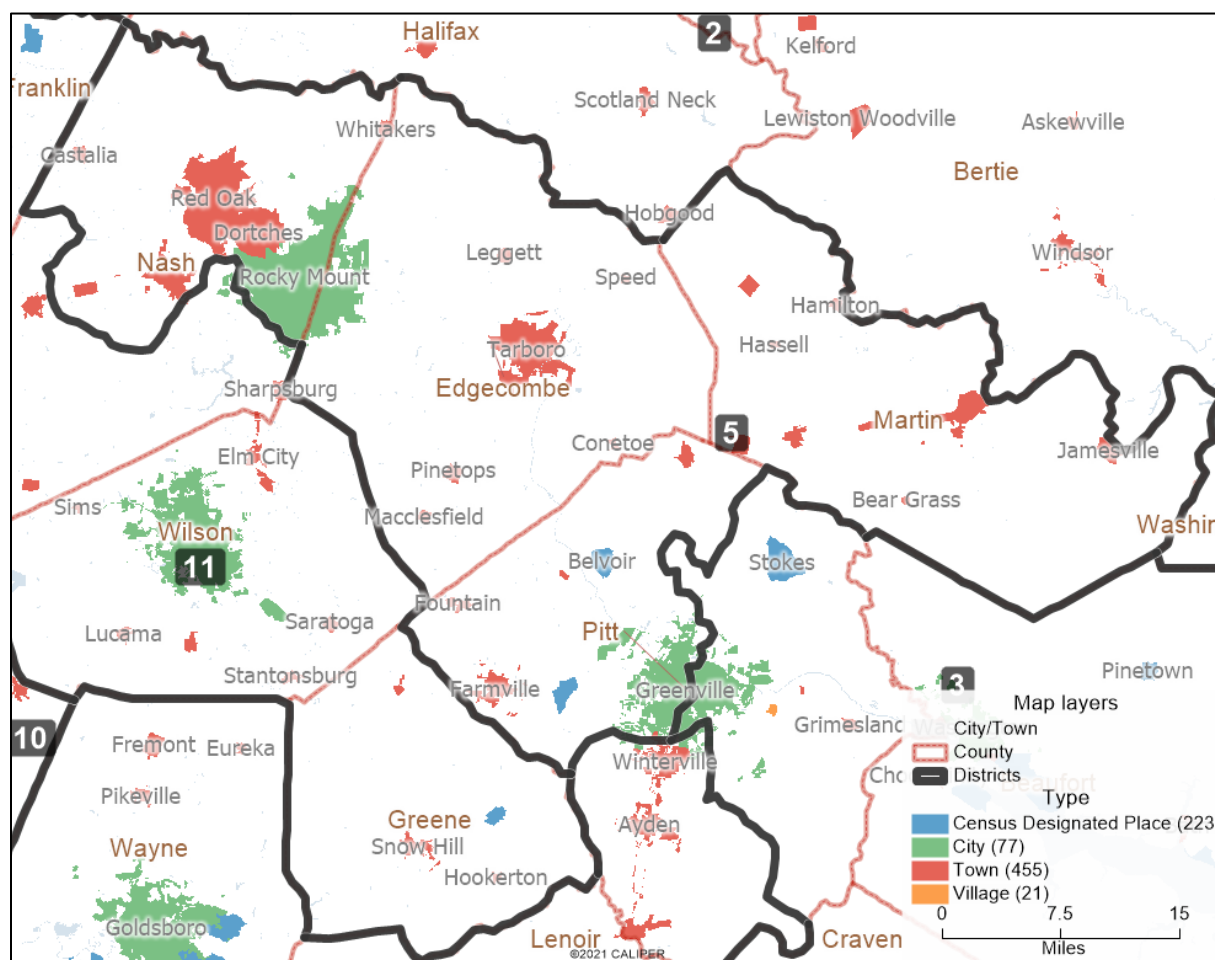
46. In fact, a view of Illustrative Plan A’s SD5 shows that it performs well when considering minimizing political subdivision splits and preserving communities of interest such as CDPs. The configuration of SD5 is shaped in part by keeping CDPs whole in neighboring districts. Figure 6 shows that the whole town of Ayden and nearly the entire town of Winterville is contained within SD4. Only a small portion of Winterville is not contained within SD4. Similarly, all of the census places in SD5<sup>32</sup> are wholly contained within the district with the exception of part of Greenville and a few census blocks of Rocky Mount and Winterville.

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<sup>30</sup> Barber September 26, 2024 Report, pg 60.

<sup>31</sup> Census Designates Places or CDPs are generated by the Census Bureau yet are routinely designated by the local community.

<sup>32</sup> Census Places are generated by the Census Bureau and include cities, towns, villages, and Census Designated Places.

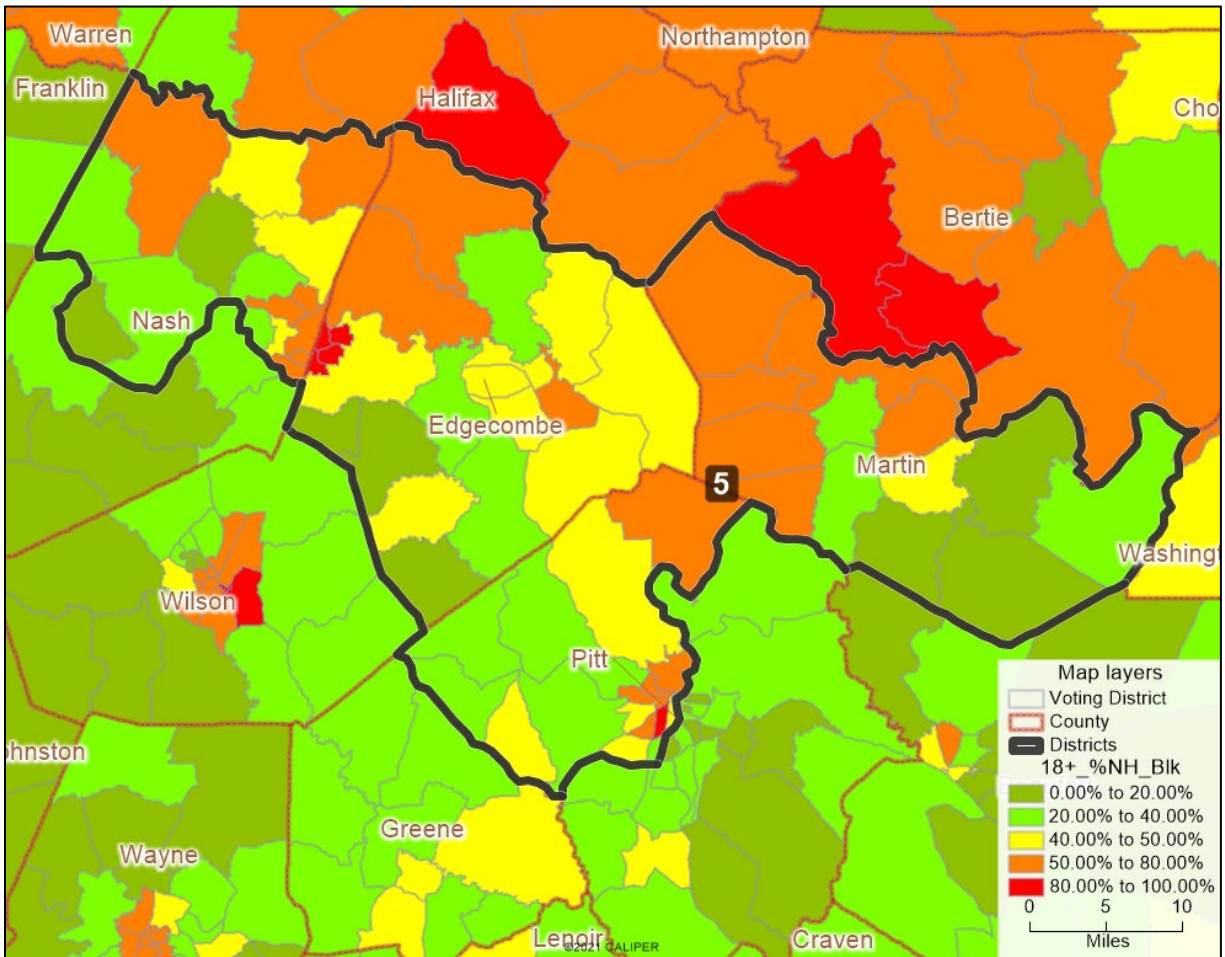


**Figure 6 - Senate Illustrative Plan A SD5 – Census Places**

An alternative perspective from Dr. Barber's viewpoint of race can be viewed by using a simpler thematic color (choropleth) of Illustrative Plan A's SD5.<sup>33</sup> A different perception can be made by viewing the entire district and using Black Voting Age Population (VAP) or BVAP%<sup>34</sup> divided into five ranges. As Figure 6 shows, a considerable number of precincts in SD5 in Pitt County do not have a majority BVAP%. In Figure 7, the darker green, lighter green and yellow precincts indicate less than 50% BVAP%. These non-majority BVAP precincts are contained within Illustrative Plan A's SD5 in the west part of Pitt County. Therefore, Illustrative Plan A's SD5 does not only include the majority Black precincts in Pitt County but a substantial amount of non-majority BVAP precincts.

<sup>33</sup> The choropleth nine color range used in Dr. Trende's maps is a bit confusing as some of the higher and lower colors tend to be very similar.

<sup>34</sup> BVAP uses the 2020 Census Not Hispanic Black Voting Age Population.



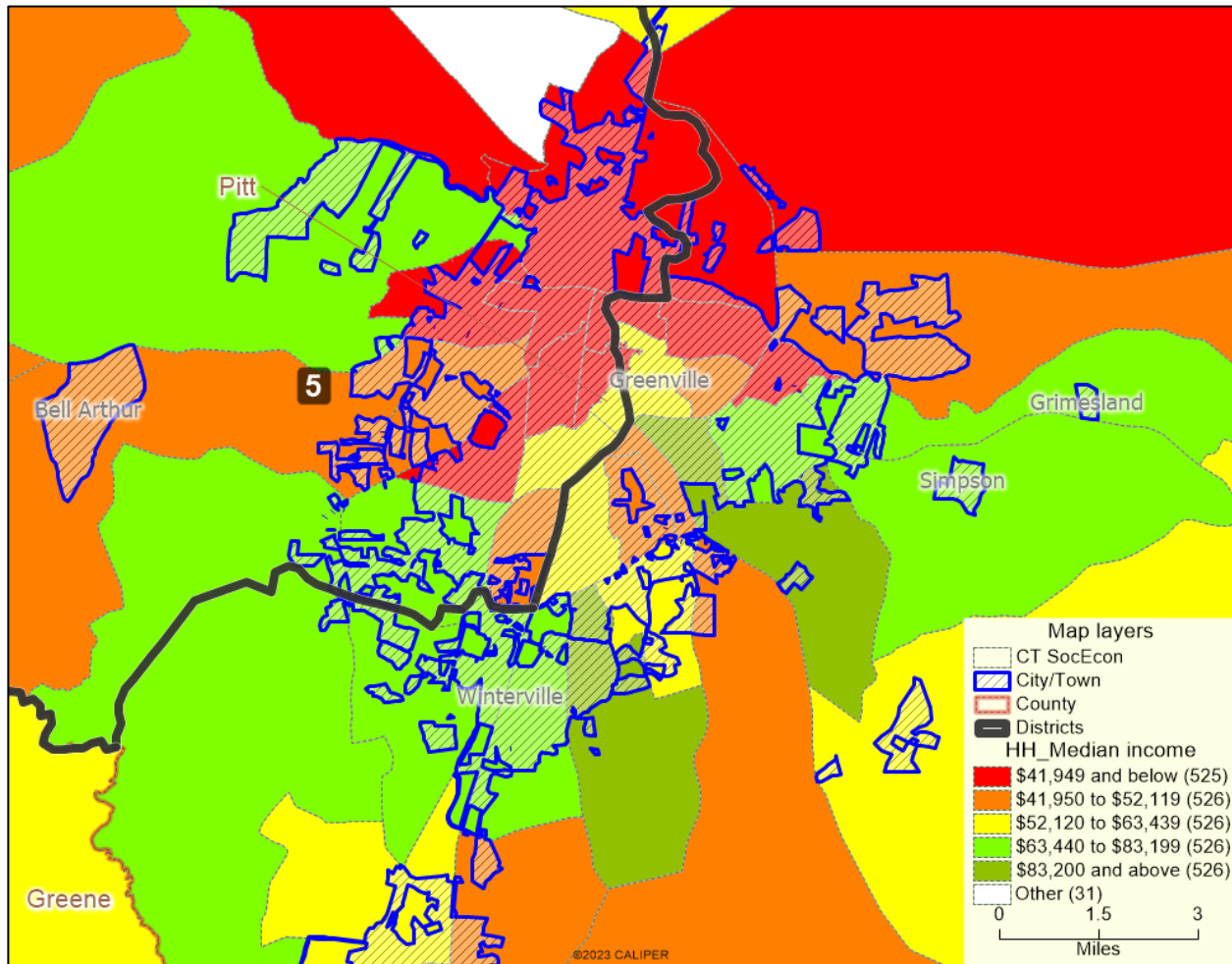
**Figure 7 - Senate Illustrative Plan A SD5 – Precincts Black VAP%**

47. In addition, the city of Greenville has a demarcation of lower income households in the north and northwest and higher income households in the southeast. This makes the Greenville SD3 and SD5 boundary a reasonable choice. Figure 8 shows the median household income<sup>35</sup> for census tracts. It is important to note that census tracts routinely overlap precincts. Thus, there is not a direct alignment to follow for the socioeconomic data and district boundaries. The red and orange represent the bottom two quintiles of median household income of census tracts for the state while the darker and lighter green depict the top two quintiles.<sup>36</sup>

<sup>35</sup> Using Caliper Corp's 2022 Dataset that includes 2021 5-Year ACS Data.

<sup>36</sup> Quintiles divides the features from top to bottom in five equal number of features. In this instance, the state's census tracts are sorted from high to low income and divided into five ranges with equal number of census tracts.





**Figure 8 - Senate Illustrative Plan A SD5 Greenville – Census Tracts Median Household Income**

48. When considering compactness, the Illustrative Plan A's SD5 fares well. A direct numeric comparison shows that SD5 in the Enacted Plan is more compact using two compactness measures, Reock and Polsby-Popper (see Table 1). However, the Illustrative Plan A's SD5 is more compact than the least compact district in the Enacted Senate Plan. This aspect is important because by passing the Enacted Plan, the state has established metrics for what they deem reasonably configured. This is especially true since compactness is one of the guidelines stated for redistricting.
49. The considerations of minimizing political subdivision splits, preserving communities of interest such as CDPs, the abundance of non-majority Black precincts, and the division of Greenville along socioeconomic characteristics show that race did not predominate during the plan drawing process of Illustrative Plan A's SD5. I continue to conclude that SD5 satisfies *Gingles* I and is reasonably configured.

**Table 1 – Senate Illustrative Plan A’s SD2 & SD5 Compactness Comparison to Enacted Plan**

	Plan A		Senate Enacted		Best	Best
	Reock	Polsby-Popper	Reock	Polsby-Popper		
Sum	N/A	N/A	N/A	N/A		
Min	0.19	0.11	0.19	0.10		
Max	0.68	0.61	0.68	0.61		
Mean	0.40	0.31	0.40	0.31	Equal	Equal
Std.	0.11	0.13	0.12	0.13		
District	Reock	Polsby-Popper	Reock	Polsby-Popper		
2	0.31	0.26	0.23	0.10	Plan A	Plan A
5	0.33	0.18	0.40	0.34	Enacted	Enacted

Source: Maptitude for Redistricting Compactness Report on Senate Illustrative Plan A and Senate Enacted Plan.

## **IX. Illustrative House Map A**

### **A. Illustrative House Plan A HD5**

50. Dr. Barber states in his September 26, 2024 report regarding Illustrative Plan A’s HD5, that “In this district the Black population is relatively evenly distributed across the district, as seen in the map below.”<sup>37</sup> Dr. Trende states in his September 26, 2024 report regarding Illustrative Plan A’s HD5 that “While there are more extreme examples of this phenomenon below, this is an example of a district that pulls together two distinct concentrations of minority voters.”<sup>38</sup>

51. I agree with the sentiment of Dr. Barber. Illustrative House Plan A’s HD5’s Black population is fairly evenly distributed throughout the district. The district is also geographically compact. With respect to Dr. Trende’s “two distinct concentrations” comments, this is a common phenomenon with rural districts that contain cities. This is certainly not an indication of noncompactness or racial predominance.<sup>39</sup> I continue to conclude that HD5 satisfies *Gingles* I and is reasonably configured.

### **B. Illustrative House Plan A HD12**

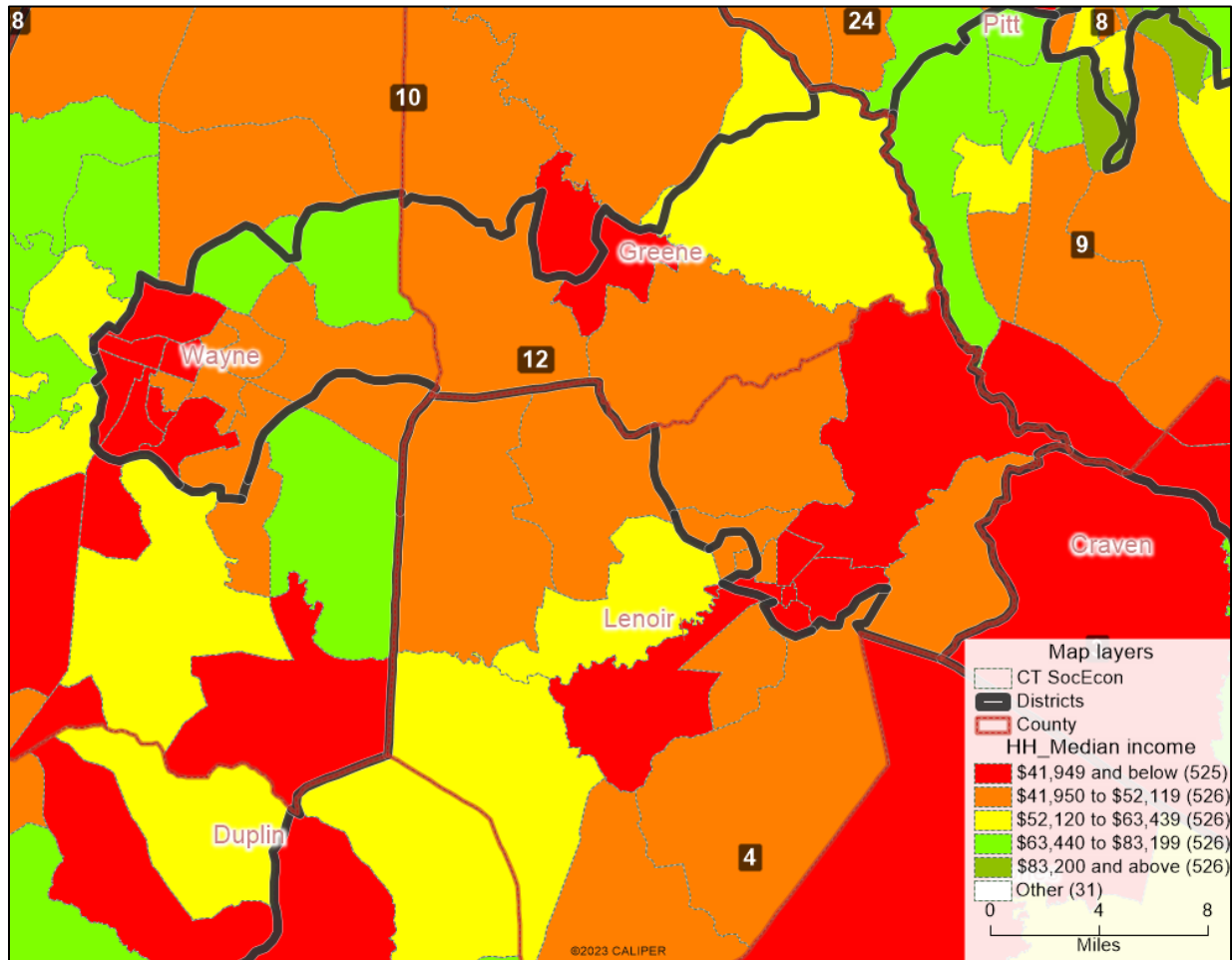
52. Dr. Barber states in his September 26, 2024 report, “As can be seen in the figure, the district is only able to achieve majority BVAP status by linking these disparate communities with an

<sup>37</sup> Barber September 26, 2024 Report, pg 75.

<sup>38</sup> Trende September 26, 2024 Report, pg 22.

<sup>39</sup> See *supra* pgs 10-12 (discussing *Allen v. Milligan*).

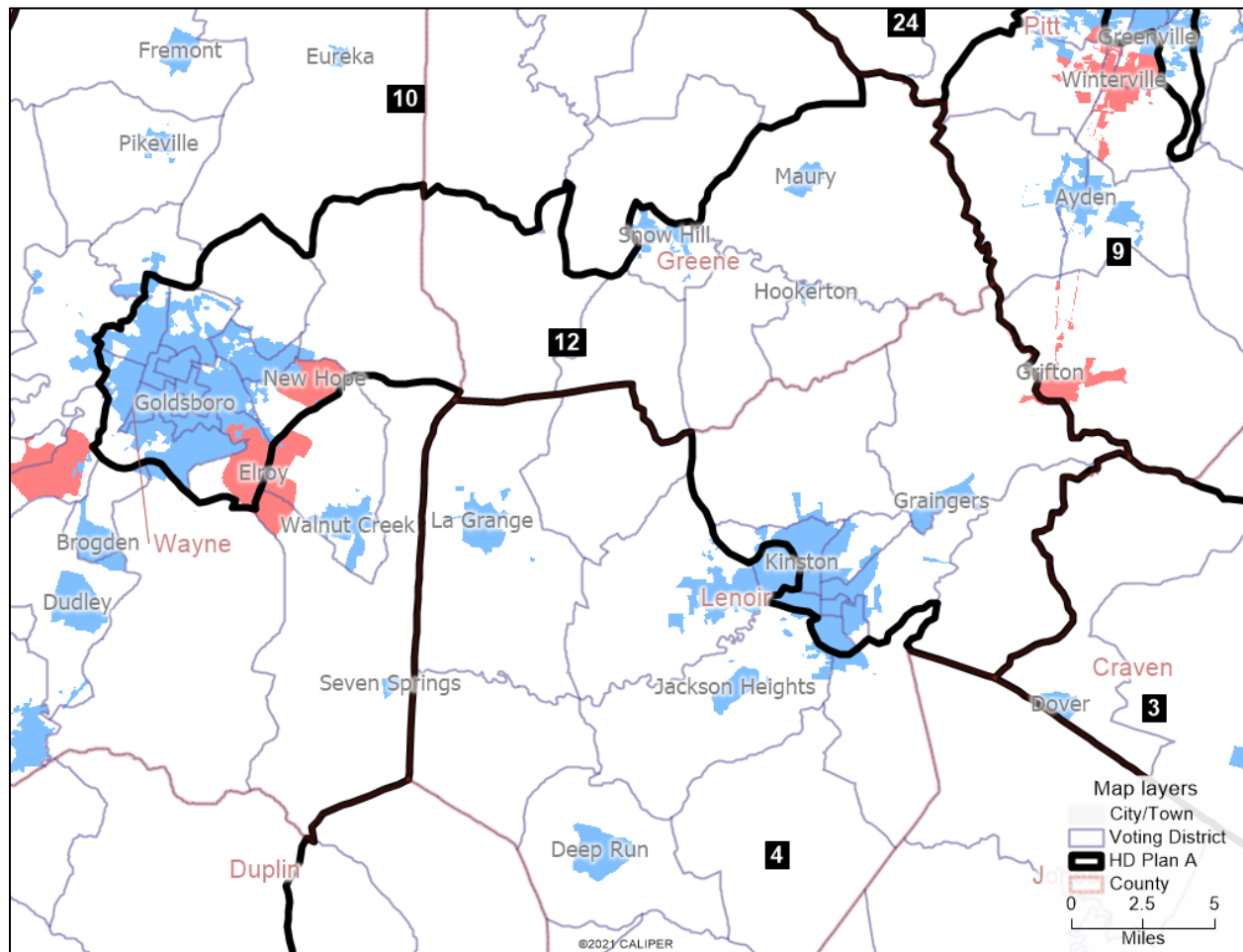
“arm” extending from Greene County into Wayne County. The district also splits these two municipalities.”<sup>40</sup> Illustrative Plan A’s HD12 does include the two cities of Goldsboro and Kinston together. However, it does that by connecting a set of similar socioeconomic areas. Figure 9 shows the median household income for the Illustrative Plan A’s HD12 and surrounding areas at the census tract level.



**Figure 9 - Illustrative Plan A HD12 – Median Household Income Census Tracts**

53. Also, the city of Goldsboro is almost wholly contained within HD12, and small areas are only excluded because a small portion of Goldsboro crosses precinct lines. Thus, the district prioritizes not splitting these precincts to add these small areas (see Figure 10). Even with these changes, Illustrative Plan A keeps more of Goldsboro whole than the Enacted House Plan, which splits the city of Goldsboro to a much more significant degree. Illustrative Plan A leaves Goldsboro largely intact.

<sup>40</sup> Barber September 26, 2024 Report, pg 77.

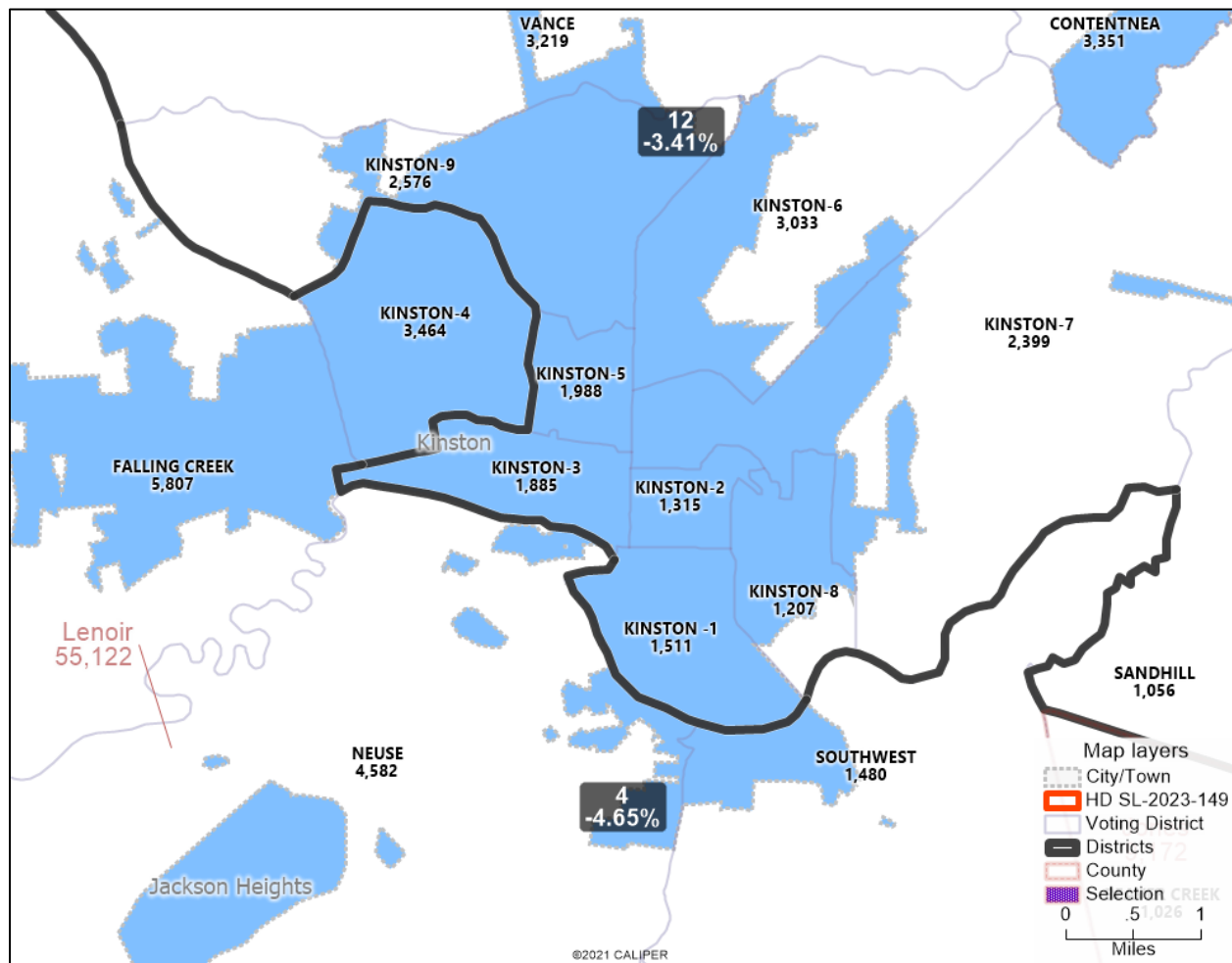


**Figure 10 - Illustrative Plan A HD12 – Census Places w Precincts**

54. Dr. Barber mentions a precinct that is left out of Illustrative Plan A’s HD12 in Kinston. He states, “In the case of Kinston, the district avoids a non-majority BVAP precinct (KINSTON-4), taking a backward ”c” shaped bite out of Kinston.”<sup>41</sup> Despite Dr. Barber’s suggestion, KINSTON-4 would add 3,464 people to Illustrative Plan A’s HD12, which would lower HD4 to -8.63% population deviation (see Figure 11). Not only that, the -8.63% starts a domino effect possibly altering other districts that have been left intact from the Enacted Plan. Ultimately, including KINSTON-4 in Illustrative Plan A’s HD12 would provide no significant redistricting criteria advantage (i.e., reducing population deviation, increasing compactness, or reducing political subdivision splits), and so Dr. Barber’s criticism here is misplaced. I continue to conclude that HD12 satisfies *Gingles* I and is reasonably configured.

<sup>41</sup> Barber September 26, 2024 Report, pg 77.





**Figure 11 - Illustrative Plan A HD12 – Kinston Zoom w Precincts Population**

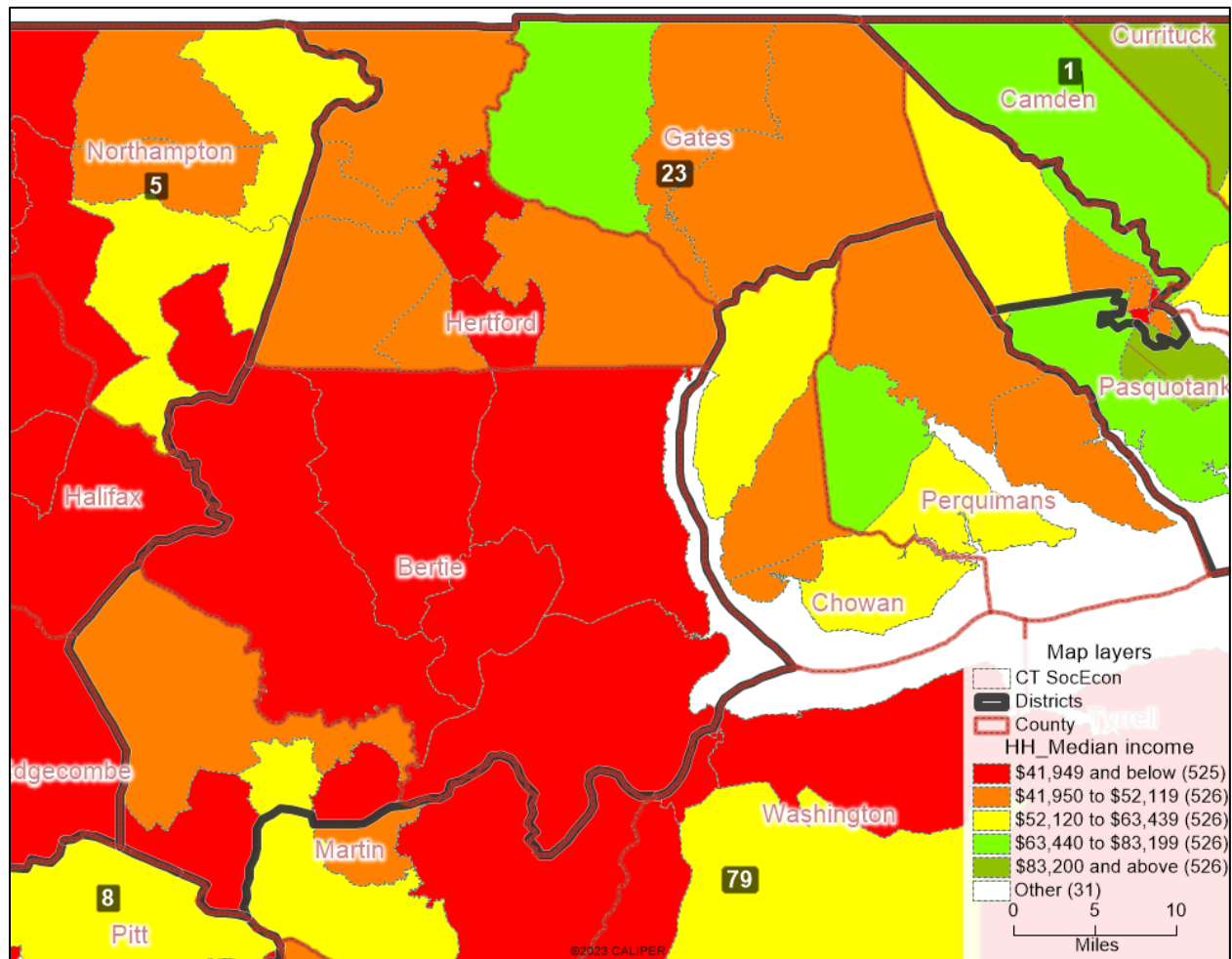
**C. Illustrative House Plan A HD23**

55. Dr. Barber and Dr. Trende point out the extension of Illustrative Plan A’s HD23 and the split of Pasquotank County. Dr. Barber states, in his September 26, 2024 report that, “This decision creates an oddly-shaped appendage to the district and links portions of Elizabeth City with communities that are several counties away, dividing them from the rest of Pasquotank County and the other Finger Counties in the region.”<sup>42</sup>

56. A review of the median household income of the census tracts in Illustrative Plan A’s HD23 shows a consistent income level throughout the district (see Figure 12). Figure 11 shows that HD23 consists of census tracts within the bottom two quintiles, except for a couple of census

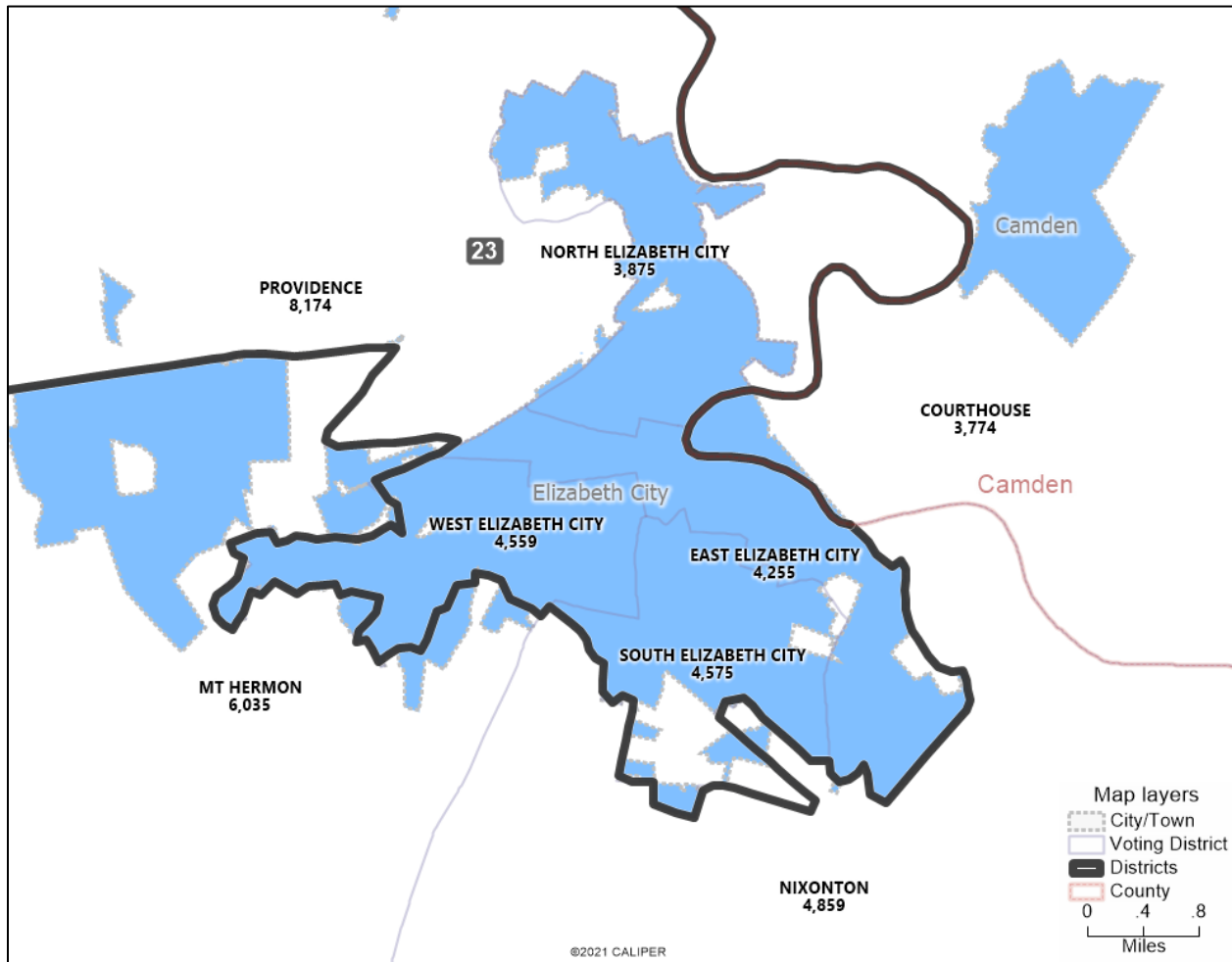
<sup>42</sup> Barber September 26, 2024 Report, pg 80.

tracts. There is a clear demarcation in Pasquotank County that HD23 follows. This demonstrates the logic of connecting this part of Pasquotank County to the other areas within HD23.



**Figure 12 - Illustrative Plan A HD23 – Median Household Income Census Tracts**

57. Also, the vast majority of Elizabeth City is included within HD23 (see Figure 13) with the exception of the west side that is contained within a large precinct (Mt. Hermon), a small part that crosses over to the adjacent county (Camden), and a small piece within another large precinct (Nixonton). Adding either of the Mt. Hermon or Nixonton precincts would dramatically increase HD23's population deviation above the allowable range of +/-5%. Adding the precinct in Camden would not exceed +5%, but it would cross a county boundary, thus splitting an additional county. The demonstrative HD23 thus appropriately prioritizes keeping population deviations within +/-5% and minimizing county splits. I continue to conclude that HD23 satisfies *Gingles* I and is reasonably configured.



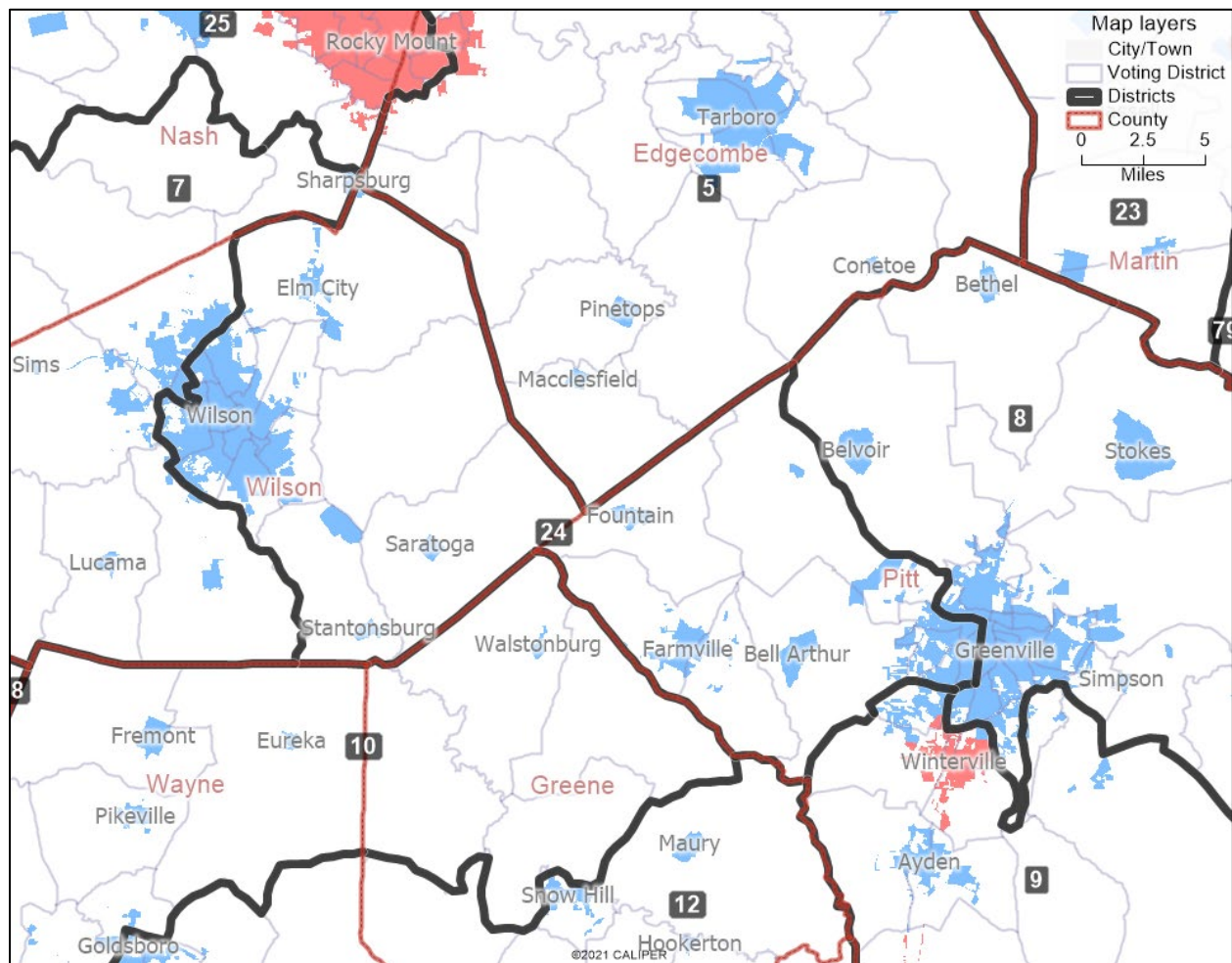
**Figure 13 - Illustrative Plan A HD23 – Elizabeth City Zoom**

**D. Illustrative House Plan A HD24**

58. Dr. Barber and Dr. Trende both comment on the shape of Illustrative Plan A’s HD24. Dr. Barber’s critique that this district “takes on an odd shape”<sup>43</sup> is misplaced. While Illustrative Plan A’s HD24 does have a shape that has a smaller height in center and expands on the ends of the district (see Figure 14), the shape is dictated by the county boundaries (county boundary lines are shown in red). The pinch in appearance is due to HD5 containing Edgecombe County and HD10 containing Greene County. In addition, the counties of Wilson and Pitt connect in a thinner area than the ends of the district. HD24 could have a larger center, however, it would result in splitting either Edgecombe or Greene counties or both. Similar configurations are

<sup>43</sup> Barber September 26, 2024 Report, pg 83.

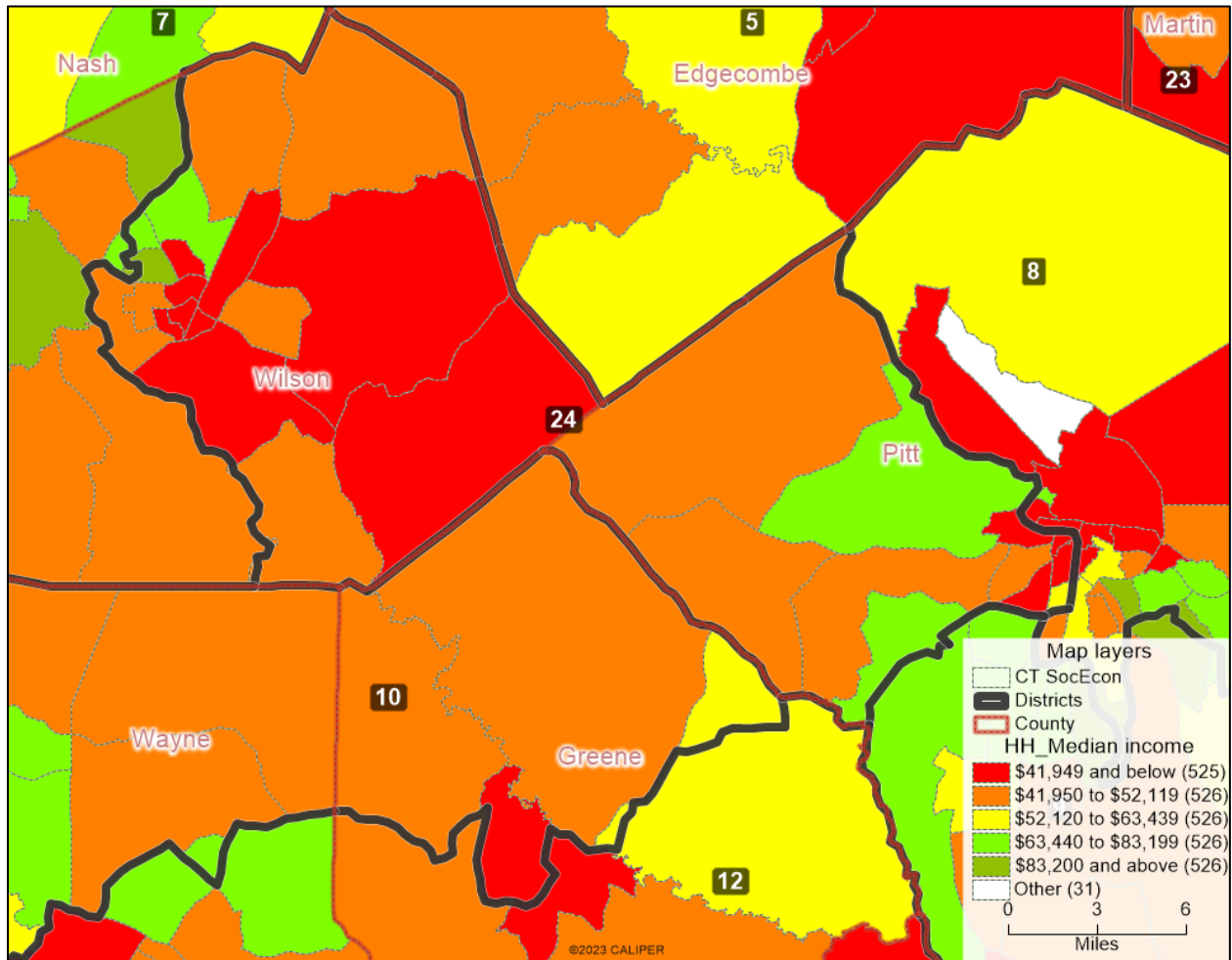
produced by the *Stephenson* county clusters at numerous places in both the State House and State Senate maps, further underscoring the acceptability of doing so in HD24.<sup>44</sup>



**Figure 14 - Illustrative Plan A HD24 – Census Places**

59. Also, as with many of the other Illustrative Plan A districts in the northeast area of North Carolina, the bulk of the district has common socioeconomic aspects. Figure 15 shows that the low median household income census tracts permeate throughout HD24 with a few exceptions. I continue to conclude that HD24 satisfies *Gingles* I and is reasonably configured.

<sup>44</sup> For similar examples in the Enacted Plans, see SD21 (Cumberland/Moore Counties), SD9 (Duplin/Jones Counties), HD50 (Caswell/Orange Counties), and HD2 (Person/Durham Counties).



**Figure 15 - Illustrative Plan A HD24 – Median Household Income Census Tracts**

E. Illustrative House Plan A HD25

60. Dr. Barber comments on the splitting of the county boundary in the Illustrative Plan A's HD25. He states, "The district must cross the county boundary to take in more of the Black population of Rocky Mount in order to be majority BVAP and contain sufficient population overall."<sup>45</sup>

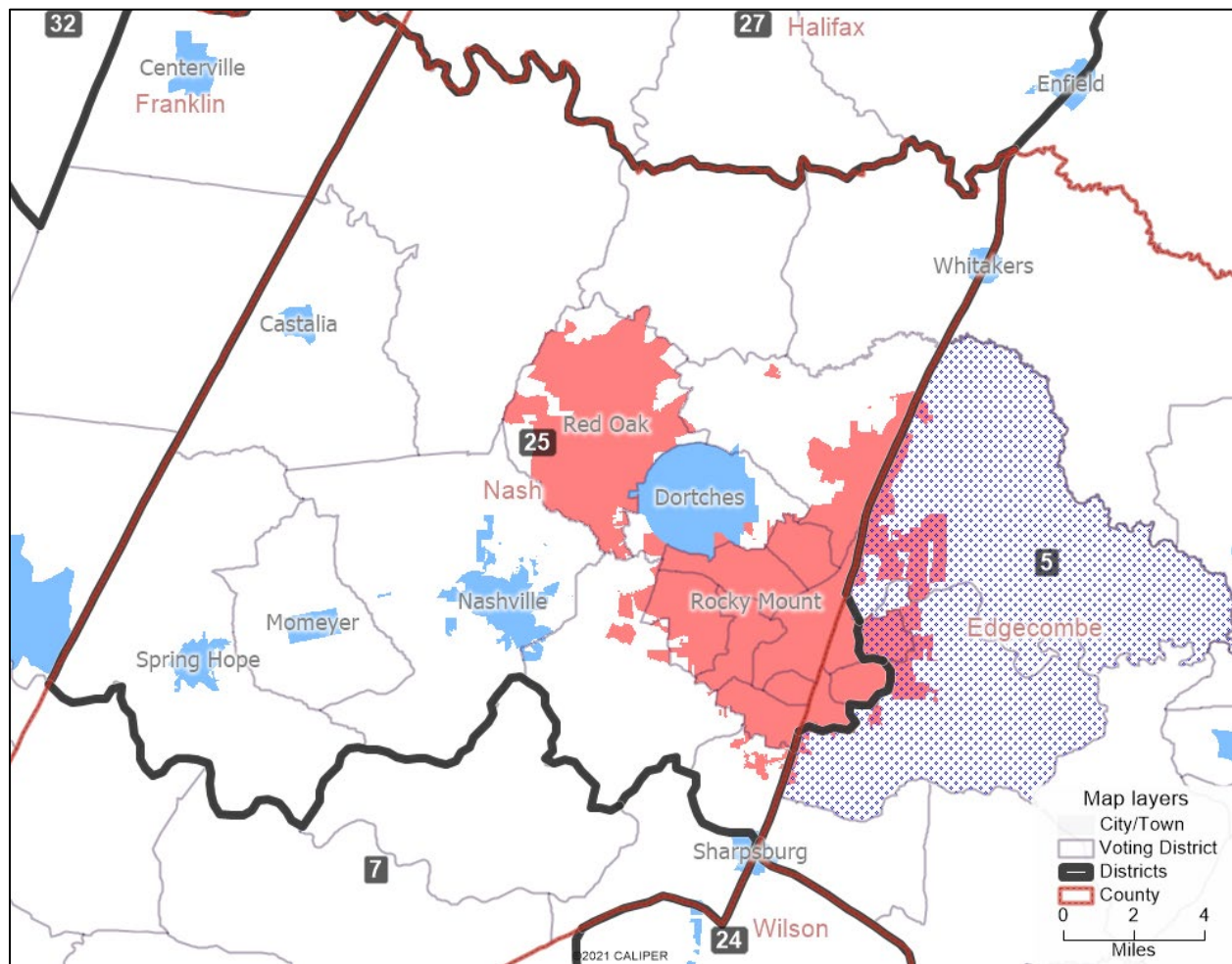
61. Illustrative Plan A's HD25 does cross over to keep more of Rocky Mount whole within HD25. Almost 90% of the city is now included in HD25.<sup>46</sup> However, because of the irregular

<sup>45</sup> Barber September 26, 2024 Report, pg 86.

<sup>46</sup> Using Barber's September 26, 2024 Report, pg 86 numbers of 5,737 people in HD5 and 54,341 total population for Rocky Mount yields 89.44% retained in HD25.



and jagged shape of Rocky Mount's annexed areas, three precincts (two of which are extremely large and contain many non-Rocky Mount areas) contain the remaining Rocky Mount city area. Figure 16 shows the precincts in the blue hatched areas. If the three precincts (Battleboro, Rocky Mount 4, and West Edgecombe) are not split along the city boundary, and the entire precincts added to HD25, this would expand the district's size and exceed the desired range of +/-5% population deviation.<sup>47</sup> Instead, HD25 adds the majority of Rocky Mount, and prioritizes accommodating the necessary population deviation requirements and minimizing precinct splits over maintaining 100% of the municipality in the same district. Thus this demonstrative district is consistent with traditional criteria, and I continue to conclude HD25 satisfies *Gingles* I and is reasonably configured.



**Figure 16 - Illustrative Plan A HD25 – Census Places w Precincts**

<sup>47</sup> If the three precincts are split and Rocky Mount is wholly placed within a single district, HD5, HD25, and HD27 could still be reconfigured and retain their majority Black status.

F. Illustrative House Plan A HD27

62. Outside of Illustrative Plan A's HD27 crossing cluster boundaries and comments on the distribution of Black population, Dr. Barber and Dr. Trende do not provide any negative comments on the district. Illustrative Plan A's HD27 is a very compact and reasonably configured district. I continue to conclude that HD27 satisfies *Gingles* I and is reasonably configured.

X. **Illustrative House Map B**

63. Dr. Barber and Dr. Trende both agree that the majority of the districts in Illustrative Plan B are very similar to the districts in Illustrative Plan A. Dr. Trende states, "Illustrative House Map B is largely the same as Illustrative House Map A. As such, there is no reason to proceed district-by-district. Districts 5, 23, 25, and 27 are all drawn effectively the same way as they were in Illustrative House Map A, although some numbering is changed, as are a few precincts."<sup>48</sup> Since HD8 and H24 are the illustrative districts with significant changes between Illustrative Plans A and B, I will address those districts separately here.

A. Illustrative House Plan B HD8

64. Dr. Trende incorrectly states that this district "shows signs of racialized line drawing" based on a misplaced assumption that the county and city were split along "racial lines."<sup>49</sup>

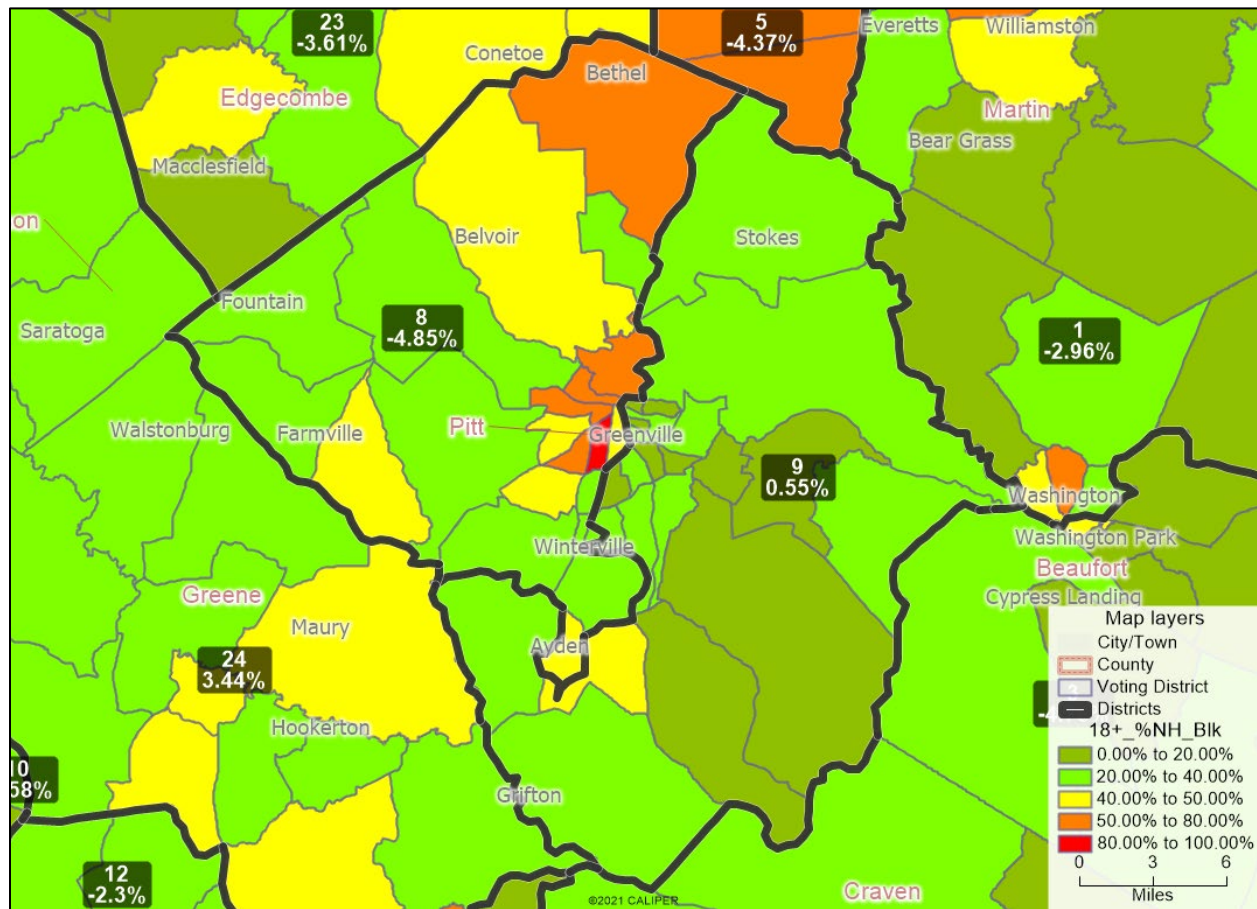
65. Illustrative Plan B's HD8 and HD9 are also drawn entirely within the same Pitt County cluster used in the Enacted Plan. Illustrative Plan B's HD8 and HD9 show compact districts drawn within the Pitt County cluster, and demonstrates it is possible, while drawing two compact House districts in the same cluster choice as the Enacted Plan in this area, that one district would result in a majority-Black district. Dr. Trende's choropleth maps are divided into nine ranges that are a little confusing. When five ranges are used, such as in Figure 17 below, a clearer perspective of the Black population can be seen.

66. In Figure 17 it is apparent that the Black population is concentrated in only a few areas of Pitt County. The red and orange precincts represent areas greater than 50% Black Voting Age Population.

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<sup>48</sup> Trende September 26, 2024 Report, pgs 43-44.

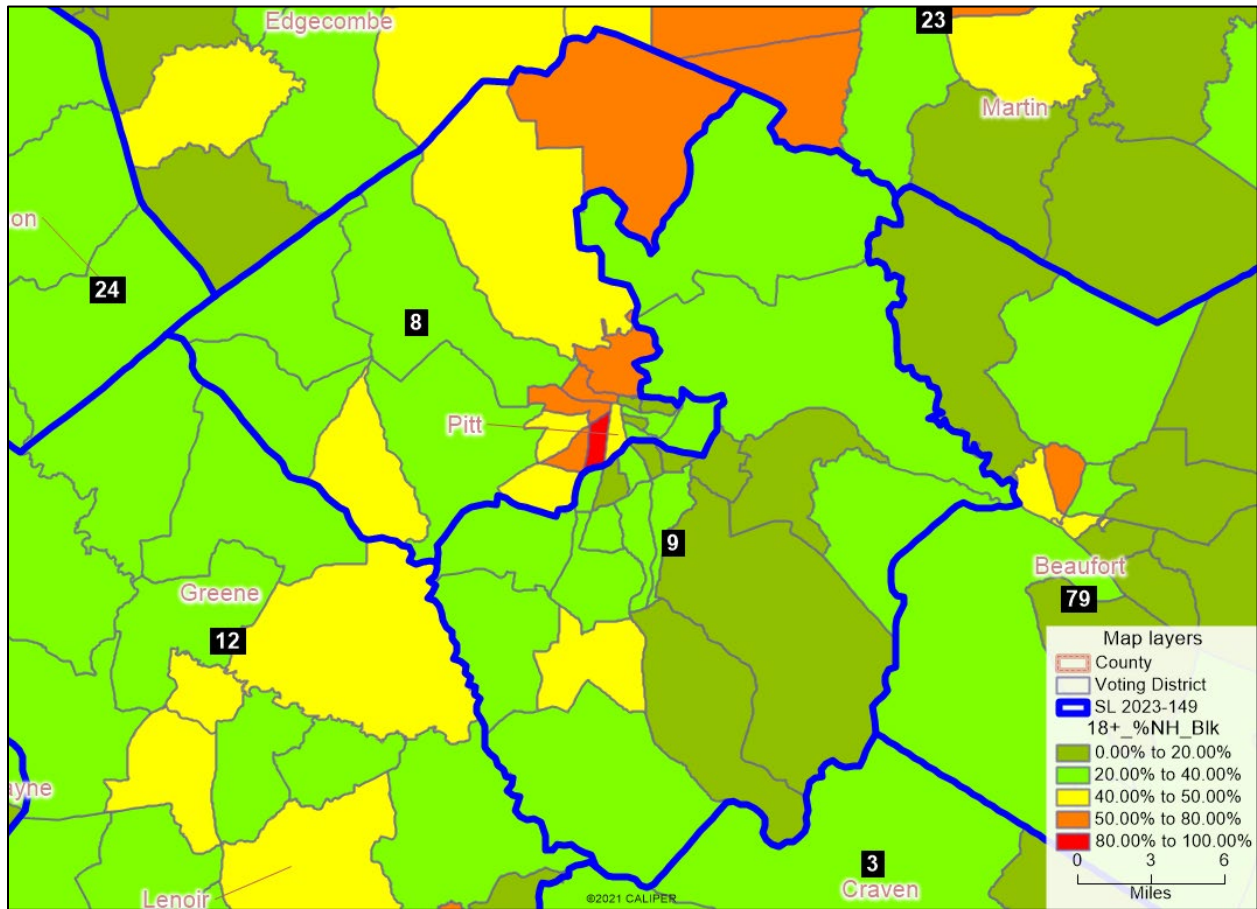
<sup>49</sup> Trende September 26, 2024 Report, pgs 46-47.



**Figure 17 - Illustrative Plan B HD8 & HD9 – Black VAP% Precincts**

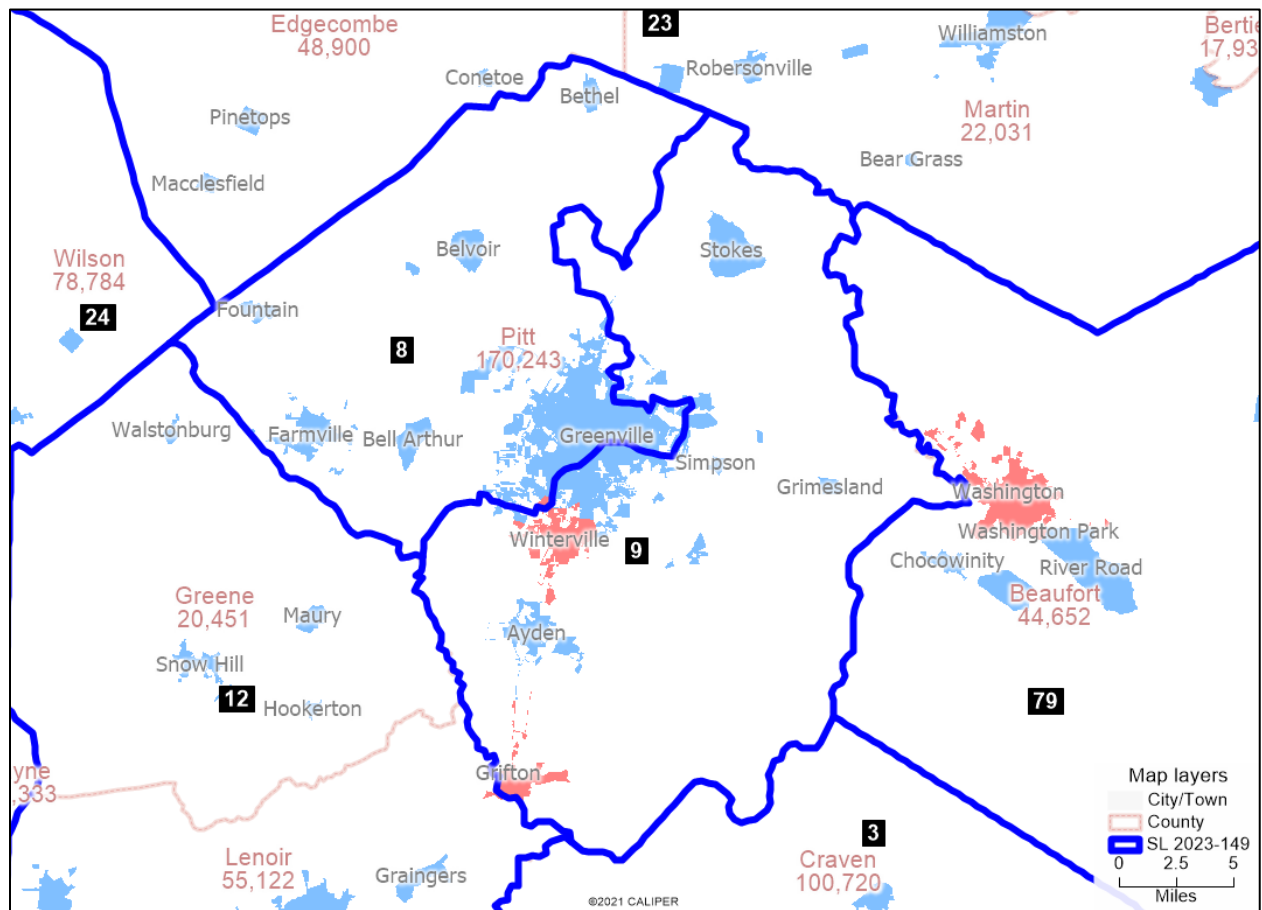
67. Overall, Illustrative Plan B's HD8 and HD9 are not that dissimilar to the Enacted Plan in regard to the split of Greenville. Figures 17 and 18 show a similar demarcation of Greenville for HD8 and HD9. The Enacted Plan and Illustrative Plan HD8 and HD9 are similarly compact as well. However, Illustrative Plan B's HD8 satisfies the first component of *Gingles I* with a BVAP% of 50.01% and the Enacted Plan's HD8 does not. This tweak of the boundary demonstrates that it is possible to draw a reasonably configured majority-Black House district entirely contained within Pitt County, and one that is quite similar to the Enacted Plan's HD8.





**Figure 18 - Enacted Plan HD8 & HD9 – Black VAP% Precincts**

68. In addition, the Enacted Plan also splits the city of Greenville. Figure 19 shows the division of Greenville in the Enacted Plan. Accordingly, both objectively and when compared to the traditional criteria measured in the Enacted Plan, it is clear that race did not need to (and in fact did not) predominate in the drafting of this to subordinate other criteria, and that House Districts 8 and 9 are reasonably configured. I continue to conclude that HD8 satisfies *Gingles* I and is a reasonably configured district.



**Figure 19 - Enacted Plan HD8 & HD9 – Census Places**

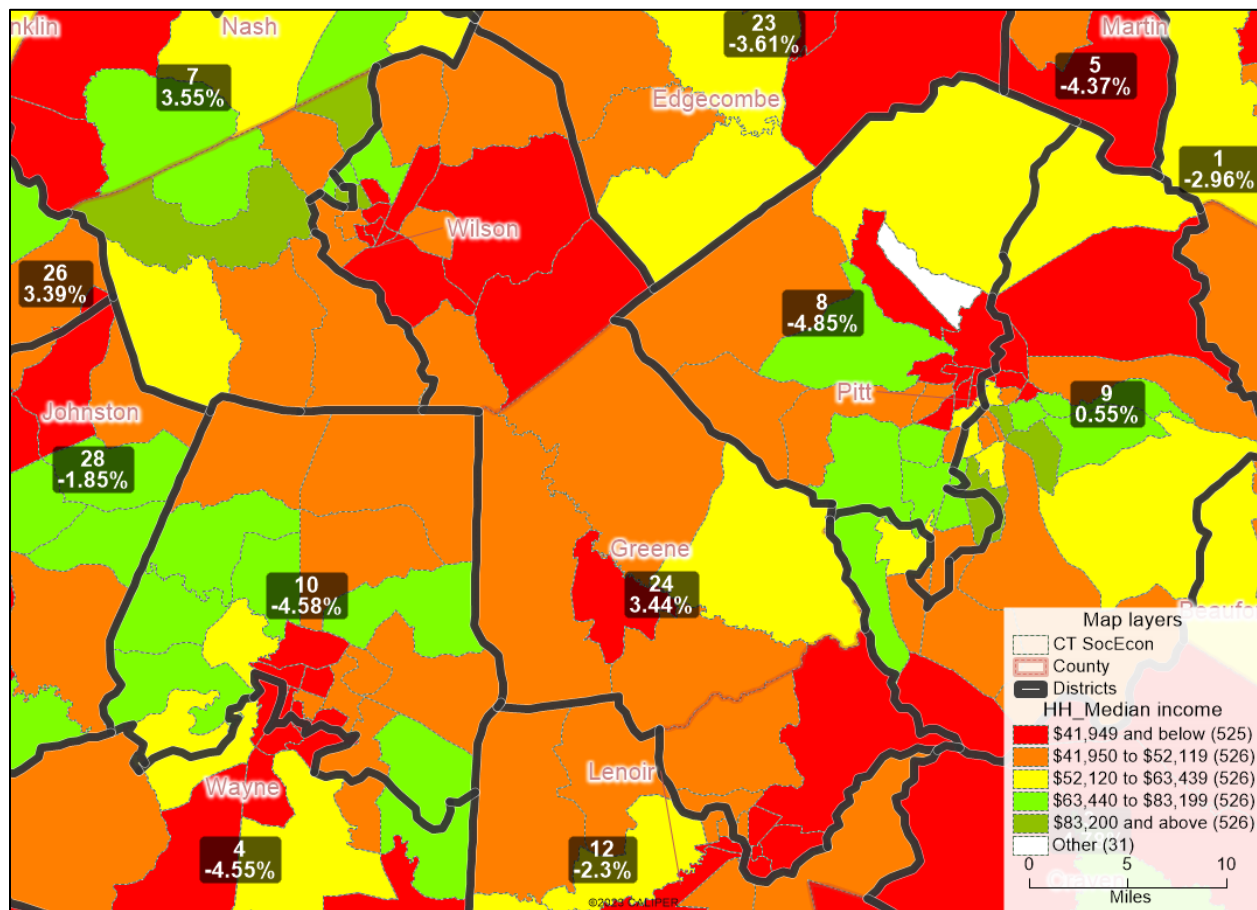
**B. Illustrative House Plan B District 24**

69. Dr. Trende erroneously states that the configuration of Illustrative House Plan B’s District 24 “clearly owes its shape to the desire to stitch together geographically distant Black populations, this time in Kinston and Wilson.”<sup>50</sup> However, Illustrative Plan B’s HD24 is a smooth, compact district extending from Wilson County to Lenoir County. In addition to its regular shape, the alignment of the district is further explained by the fact that it is situated between the fixed Pitt County cluster and the fixed Wayne-Duplin cluster and Edgecombe County with HD23. Thus, the options for configuration of HD24 are limited.

70. In addition, as with other districts contained within the Illustrative Plan B, HD24 includes common socioeconomic attributes that bind the district together. Specifically, Figure 20 shows

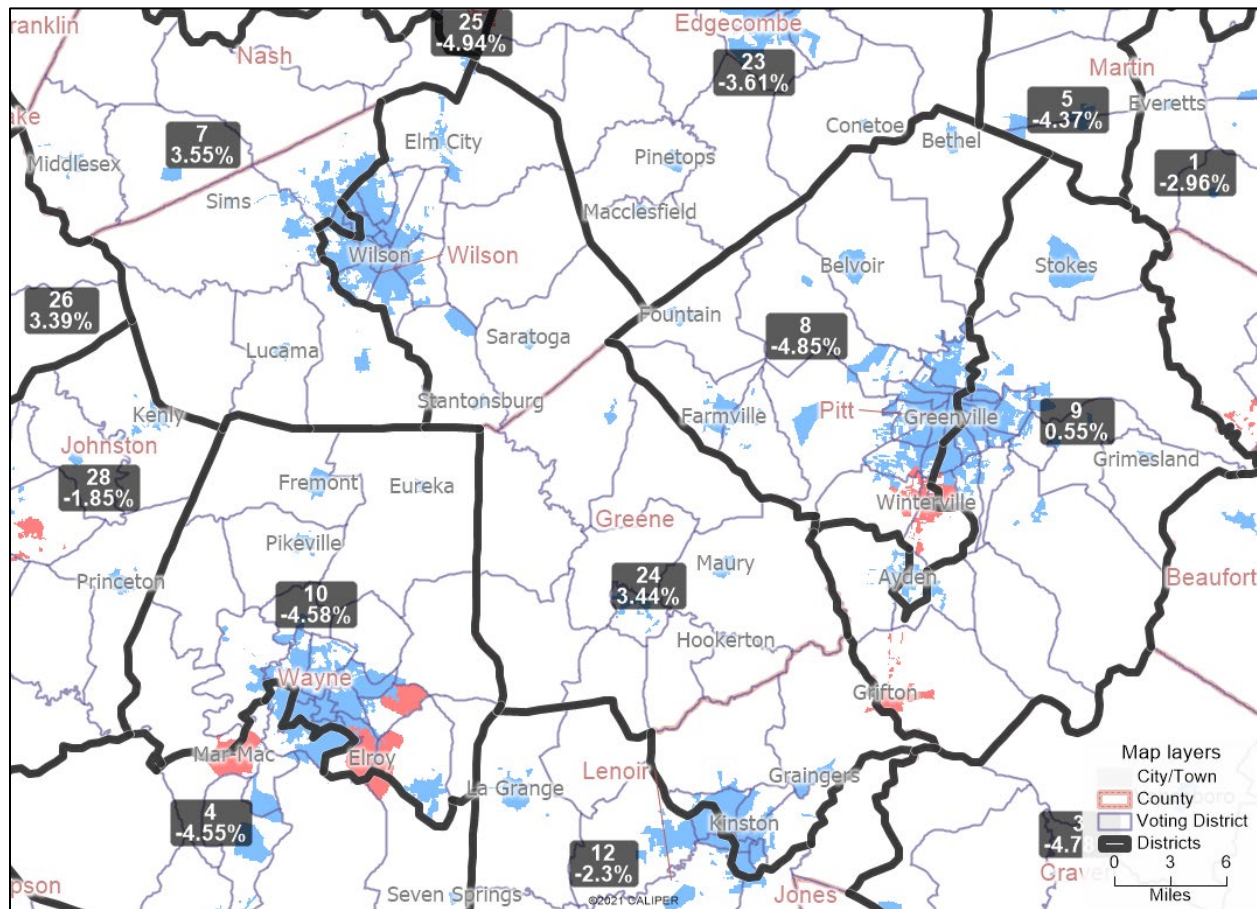
<sup>50</sup> Trende September 26, 2024 Report, pg 48.

the median household income for HD24. The vast majority of census tracts within Illustrative Plan B's HD24 are in the bottom two quintiles of median household income.



**Figure 20 - Illustrative Plan B HD24 – Median Household Income Census Tracts**

71. The city of Wilson is split between Illustrative Plan B's HD24 and HD7 because adding any surrounding precinct in Wilson and Kinston would cause HD24 to exceed the desired +/-5% population deviation (see Figure 21). This can be seen in Dr. Trende's Figure 36, which shows that, in Wilson, fairly large precincts would need to be added or split in order to wholly contain the city of Wilson. In Kinston, Dr. Trende's assertion that racial lines were drawn is easily shown to be misplaced, as it is noticeable in Figure 37 of his report that a majority Black precinct from Kinston is in HD12 and not in HD24. This district thus adheres to traditional redistricting criteria, including compactness, while working within the constraints posed by adjoining fixed clusters. Thus, I continue to conclude that HD24 satisfies *Gingles I* and is reasonably configured.



**Figure 21 - Illustrative Plan B HD24 – Census Places**

## **XI. Conclusion**

72. After reviewing the analysis and responses from Dr. Barber and Dr. Trendle, my opinions remain the same as in my August 1, 2024 Report.

Dated: 10/17/24

Signed: Anthony E. Fairfax  
Anthony Fairfax

# **Fairfax Rebuttal Report Appendix A**

Apportionment Analysis Maps and Tables

Enacted Plan New Hanover SD7-8 Zoom – Removed Black Population Areas



Wake County House Districts Cluster

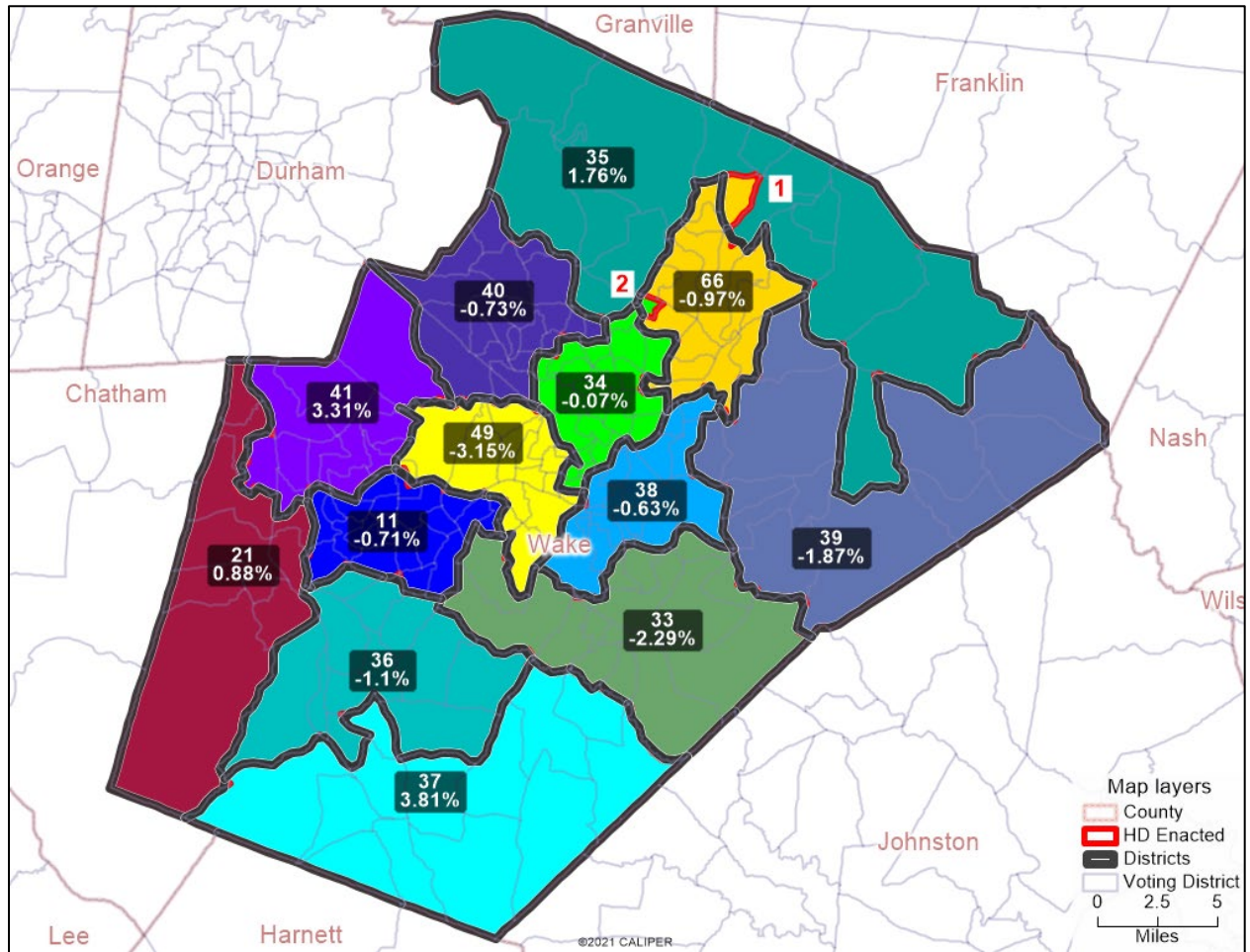


Figure A-1: Example Modified Plan of HD Wake County Cluster using Two Precinct Changes  
Precinct 19-11 (#1) moved from HD66 to HD35 and  
Precinct 13-2 (#2) moved from HD34 to HD66

Table A-1: HD Wake County Cluster Enacted and Modified Plans Deviations

	<b>Enacted Plan</b>	<b>Modified Plan</b>
<b>Total Cluster Deviation</b>	8.29%	6.96% <sup>1</sup>

Table A-2: HD Wake County Cluster Enacted and Modified Plans Compactness Analysis

<b>Enacted</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Modified</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
<b>Sum</b>	N/A	N/A		<b>Sum</b>	N/A	N/A			
<b>Min</b>	0.26	0.21		<b>Min</b>	0.26	0.22		Equal	Modified
<b>Max</b>	0.50	0.39		<b>Max</b>	0.52	0.50		Modified	Modified
<b>Mean</b>	0.40	0.31		<b>Mean</b>	0.41	0.33		Modified	Modified
<b>Std. Dev.</b>	0.08	0.05		<b>Std. Dev.</b>	0.09	0.08			
<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
11	0.44	0.39		11	0.44	0.39		Equal	Equal
21	0.26	0.32		21	0.26	0.32		Equal	Equal
33	0.40	0.28		33	0.40	0.28		Equal	Equal
34	0.43	0.32		34	0.47	0.36		Modified	Modified
35	0.27	0.21		35	0.28	0.22		Modified	Modified
36	0.41	0.34		36	0.41	0.34		Equal	Equal
37	0.33	0.35		37	0.33	0.35		Equal	Equal
38	0.34	0.30		38	0.34	0.30		Equal	Equal
39	0.50	0.25		39	0.50	0.25		Equal	Equal
40	0.49	0.37		40	0.49	0.37		Equal	Equal
41	0.46	0.33		41	0.46	0.33		Equal	Equal
49	0.45	0.29		49	0.45	0.29		Equal	Equal
66	0.42	0.25		66	0.42	0.28		Equal	Modified

Source: Maptitude for Redistricting Compactness Reports of HD Wake County Cluster Enacted and Modified Plans

<sup>1</sup> Small differences (less than 0.01%) may be introduced by rounding errors performed by Maptitude.

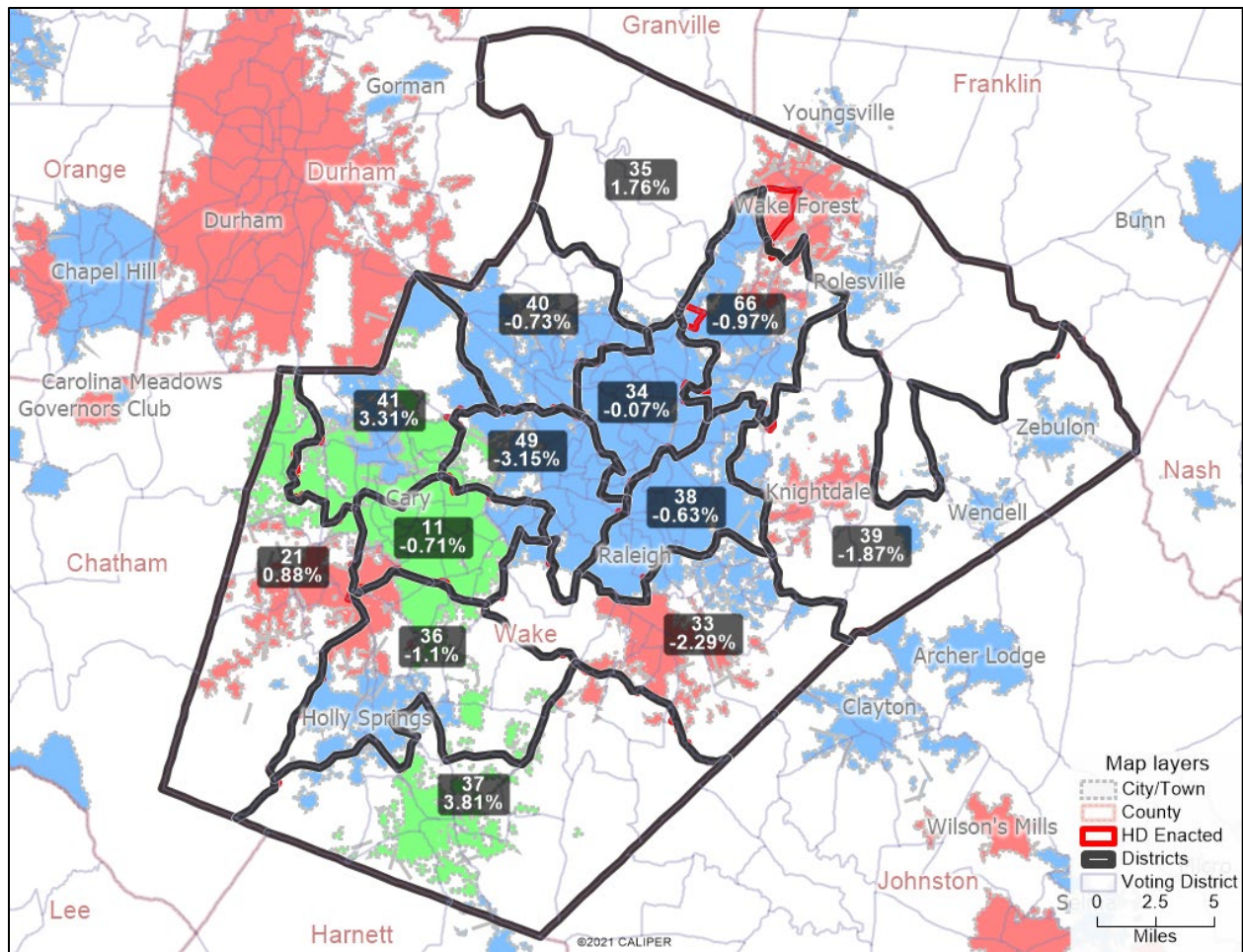


Figure A-2: Example Modified Plan of HD Wake County Cluster with Census Places



Forsyth – Stokes House Districts Cluster

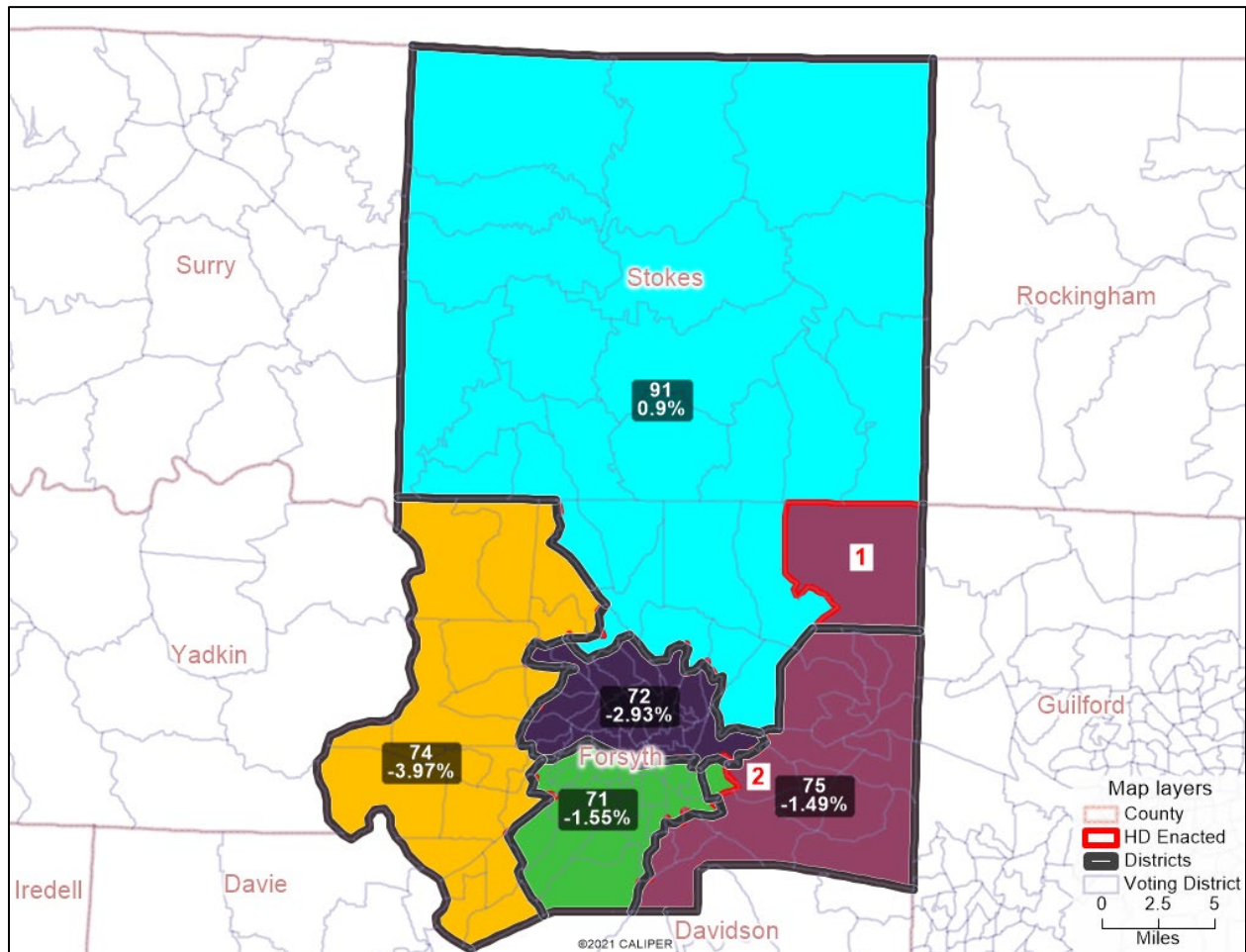


Figure B-1: Example Modified Plan of HD Forsyth-Stokes Cluster using Two Precinct Changes  
Precinct Belews Creek Fire (#1) moved from HD75 to HD91  
St Andrews Methodist precinct (#2) moved from HD71 and added to HD75

Table B-1: HD Forsyth-Stokes Cluster Enacted and Modified Plans Deviations

	<b>Enacted Plan</b>	<b>Modified Plan</b>
<b>Total Cluster Deviation</b>	6.78%	4.87%

Table B-2: HD Forsyth-Stokes Cluster Enacted and Modified Plans Compactness Analysis

<b>Enacted</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Modified</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
<b>Sum</b>	N/A	N/A		<b>Sum</b>	N/A	N/A			
<b>Min</b>	0.31	0.25		<b>Min</b>	0.37	0.25		Modified	Equal
<b>Max</b>	0.56	0.48		<b>Max</b>	0.60	0.55		Modified	Modified
<b>Mean</b>	0.43	0.35		<b>Mean</b>	0.47	0.39		Modified	Modified
<b>Std. Dev.</b>	0.10	0.09		<b>Std. Dev.</b>	0.12	0.12			
<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
71	0.50	0.40		71	0.60	0.44		Modified	Modified
72	0.38	0.25		72	0.38	0.25		Equal	Equal
74	0.40	0.30		74	0.40	0.30		Equal	Equal
75	0.31	0.32		75	0.37	0.39		Modified	Modified
91	0.56	0.48		91	0.59	0.55		Modified	Modified

Source: Maptitude for Redistricting Compactness Reports of HD Forsyth-Stokes Cluster Enacted and Modified Plans

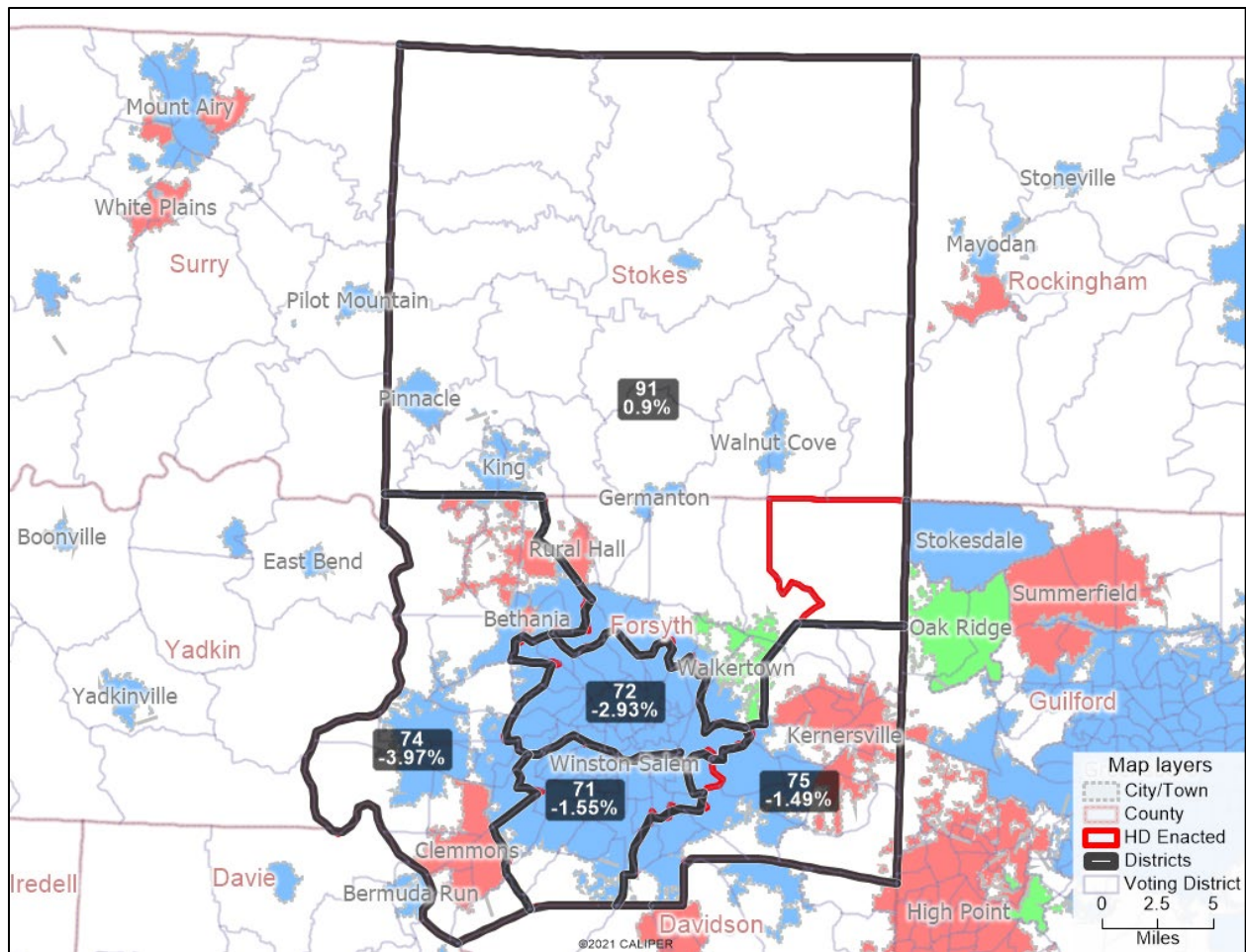


Figure B-2: Example Modified Plan of HD Forsyth-Stokes Cluster with Census Places

Brunswick, New Hanover, and Columbus Senate Districts Cluster

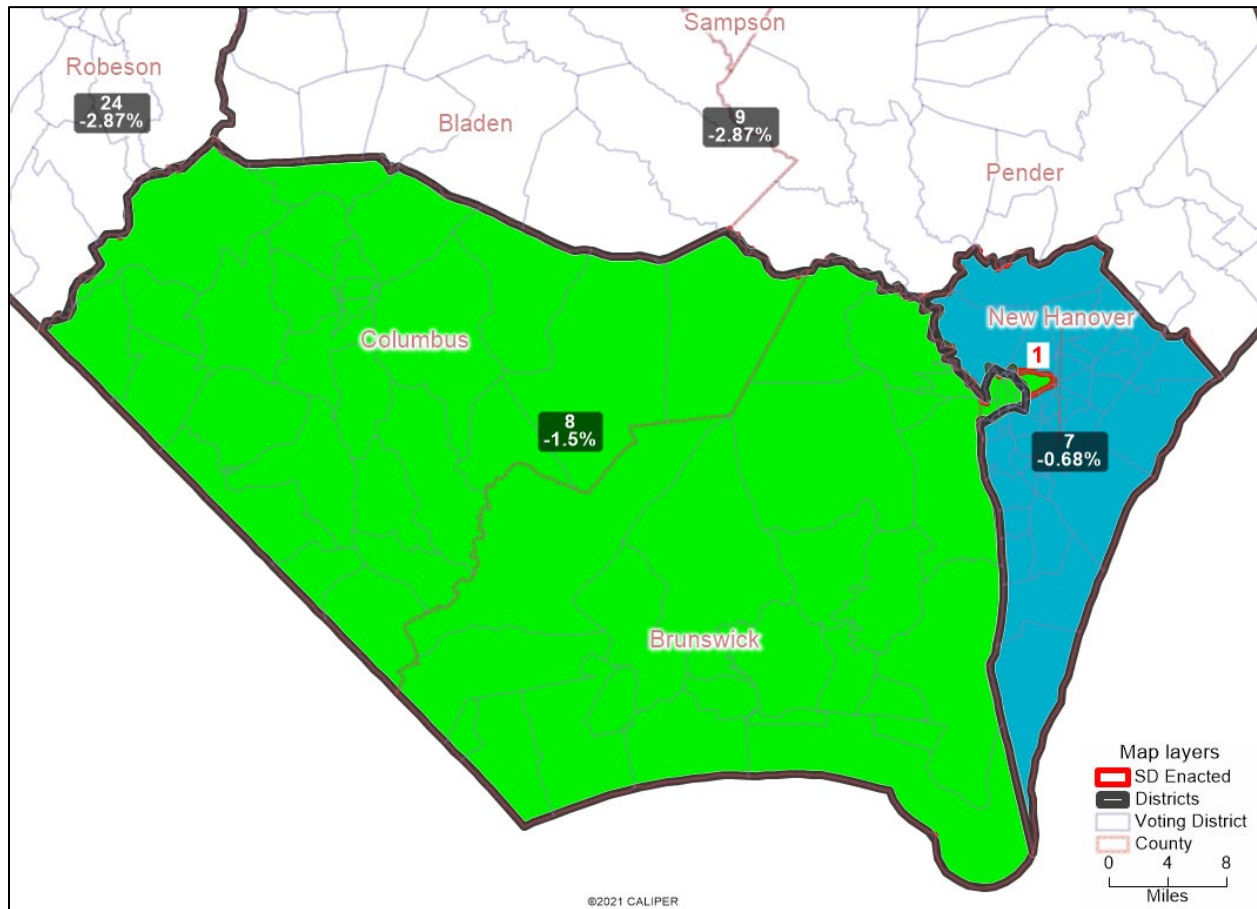


Figure C-1: Example Modified Plan of SD New Hanover Cluster using One Precinct Change  
Precinct W15 moved from SD8 to SD7

Table C-1: SD New Hanover Cluster Enacted and Modified Plans Deviations

	<b>Enacted Plan</b>	<b>Modified Plan</b>
<b>Total Cluster Deviation</b>	7.69%	0.82%

Table C-2: SD New Hanover Cluster Enacted and Modified Plans Compactness Analysis

<b>Enacted</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Modified</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
<b>Sum</b>	N/A	N/A		<b>Sum</b>	N/A	N/A			
<b>Min</b>	0.23	0.21		<b>Min</b>	0.24	0.23		Modified	Modified
<b>Max</b>	0.44	0.42		<b>Max</b>	0.44	0.44		Equal	Modified
<b>Mean</b>	0.34	0.32		<b>Mean</b>	0.34	0.34		Equal	Modified
<b>Std. Dev.</b>	0.15	0.15		<b>Std. Dev.</b>	0.14	0.15			
<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
7	0.23	0.21		7	0.24	0.23		Modified	Modified
8	0.44	0.42		8	0.44	0.44		Equal	Modified

Source: Maptitude for Redistricting Compactness Reports of SD New Hanover Cluster Enacted and Modified Plans



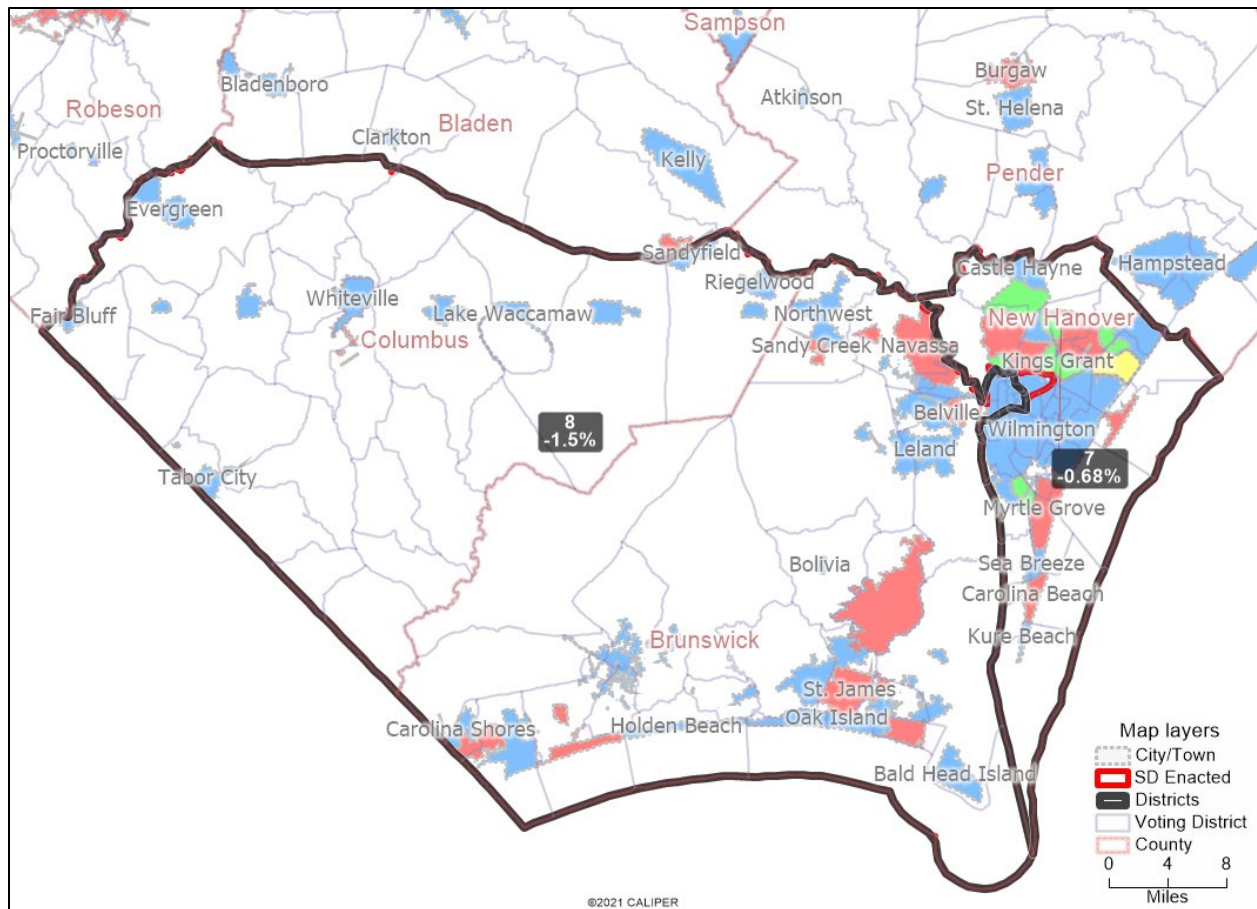


Figure C-2: Example Modified Plan of SD New Hanover Cluster with Census Places

Iredell-Mecklenburg Senate Districts Cluster

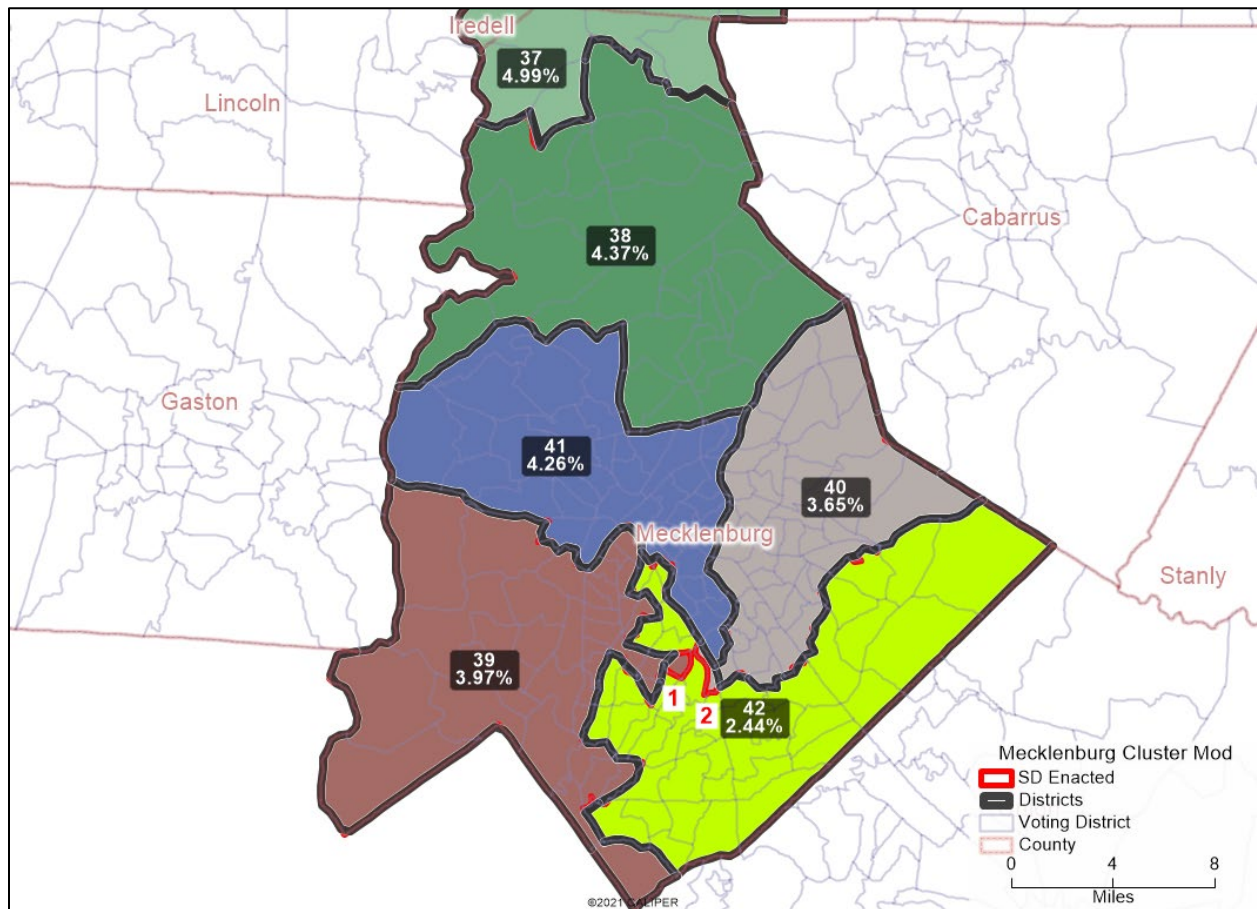


Figure D-1: Example Modified Plan of SD Mecklenburg Cluster using Two Precinct Changes  
Precinct 072 (#1) moved from SD39 to SD42  
Precinct 119 (#2) moved from SD40 to SD42

Table D-1: SD Mecklenburg Cluster Enacted and Modified Plans Deviations

	<b>Enacted Plan</b>	<b>Modified Plan</b>
<b>Total Cluster Deviation</b>	4.71%.	2.55%

Table D-2: SD Mecklenburg Cluster Enacted and Modified Plans Compactness Analysis

<b>Enacted</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Modified</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
Sum	N/A	N/A		Sum	N/A	N/A			
Min	0.30	0.19		Min	0.31	0.21		Modified	Modified
Max	0.50	0.42		Max	0.50	0.42		Equal	Equal
Mean	0.39	0.30		Mean	0.40	0.32		Modified	Modified
Std. Dev.	0.07	0.09		Std. Dev.	0.06	0.09			
<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>District</b>	<b>Reock</b>	<b>Polsby-Popper</b>		<b>Best</b>	<b>Best</b>
37	0.40	0.42		37	0.40	0.42		Equal	Equal
38	0.50	0.30		38	0.50	0.30		Equal	Equal
39	0.39	0.20		39	0.39	0.21		Equal	Modified
40	0.35	0.36		40	0.37	0.42		Modified	Modified
41	0.41	0.33		41	0.41	0.33		Equal	Equal
42	0.30	0.19		42	0.31	0.21		Modified	Modified

Source: Maptitude for Redistricting Compactness Reports of SD Mecklenburg Cluster Enacted and Modified Plans

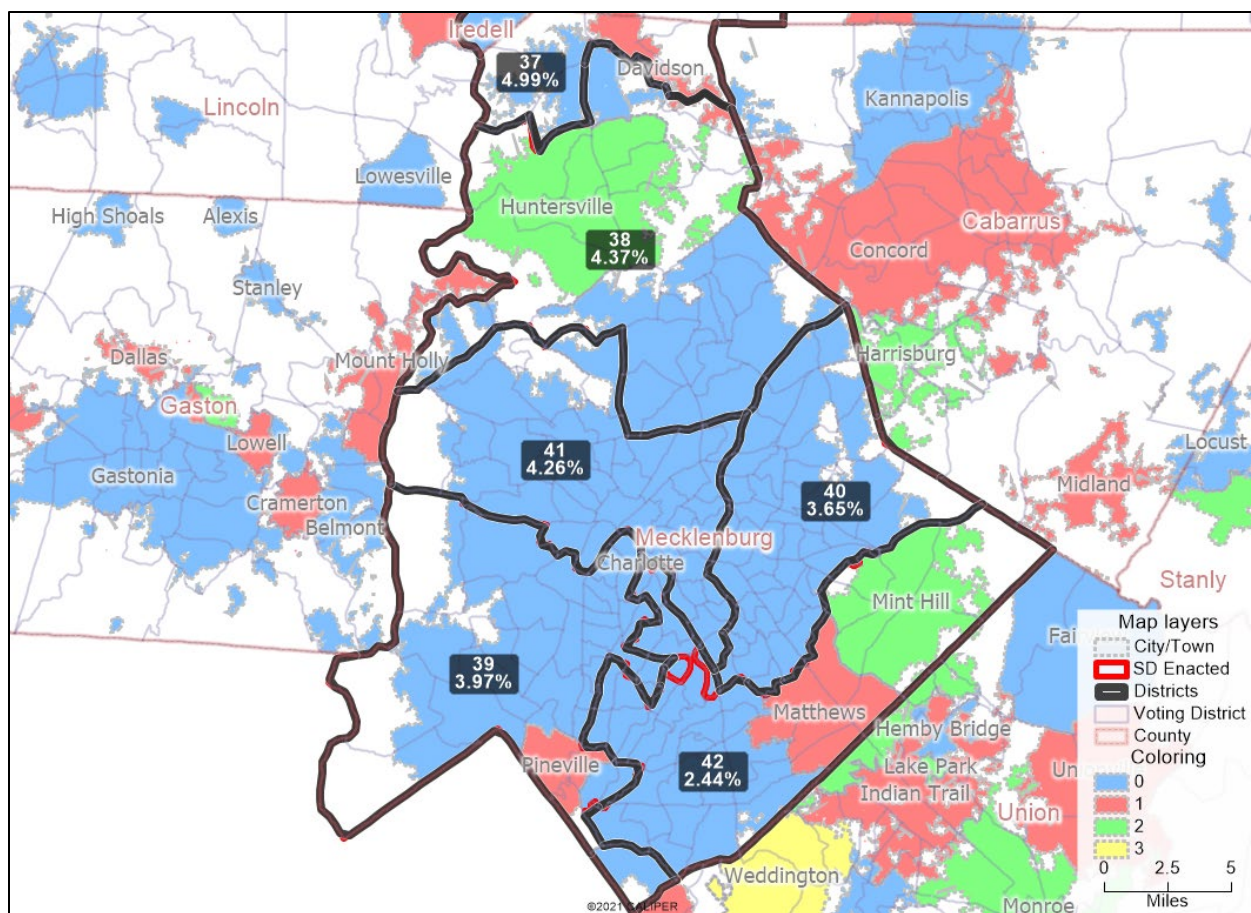


Figure D-2: Example Modified Plan of SD Mecklenburg Cluster (Zoom) with Census Places

